

**Utah Department of Transportation**



**Supplemental Specifications  
for**

**2005 Standard  
Specifications**

**FOR ROAD AND BRIDGE  
CONSTRUCTION**

**U.S. Standard Units (Inch-Pound Units)**

**Issued May 10, 2007**

# Memorandum

UTAH DEPARTMENT OF TRANSPORTATION

**DATE:** May 10, 2007

**TO:** Holders of Hard Copy of Standard Specifications

**FROM:** Barry Axelrod, CDT  
Standards and Specifications

**SUBJECT:** Supplemental Specifications Distribution, dated May 10, 2007

Applicable files for the change are attached. Maintain these files as a supplemental update to the UDOT Standard Specifications dated January 1, 2005. No pages are to be removed or replaced in the basic book, electronic or hard copy.

If you are in need of electronic copies of any Standard or Supplemental Specification please refer to the Standards and Specifications Web site at <http://www.udot.utah.gov/main/f?p=100:pg:12632538475555658704:::V,T::302>. From there select the **2005 Standards** subtopic.

Please note that the 2005 Standards are still in effect. The next version of the Standards is planned for 2008.

If you have any questions or problems with the electronic files contact me at 801-964-4570 or by email at [baxelrod@utah.gov](mailto:baxelrod@utah.gov).

Attachments

## **Listing of Supplemental Specifications**

### **Issue Date: March 14, 2005**

Revised February 24, 2005

Section 01282M Article 1.1 Paragraph D added and Article 1.14 Paragraph E replaced.

Section 01284 New section added

Section 02785M Replaces Table 1 to correct reference callout from AASHTO to ASTM

Section 02843 Entire section revised.

Section 06055M Article 1.2 Paragraph F added and Article 2.2 Paragraphs A and D modified.

### **Issue Date: May 10, 2005**

Revised April 28, 2005

Section 02827 New section added

### **Issue Date: July 12, 2005**

Revised June 30, 2005

Section 02745 Entire section revised.

Section 03412M Article 1.3 revised, Article 1.4 Paragraph E added, Article 1.5 Paragraph C added, and Article 3.7 added.

Section 05120 M Article 1.3 revised, Article 1.4 Paragraph D added, and Article 3.5 added.

### **Issue Date: September 12, 2005**

Revised August 25, 2005

Section 01452M Article 3.1 Paragraph B item 1 replaced.

Section 01571 Entire section replaced.

Section 01574M Article 1.1 replaced, Article 1.3 Paragraph B added, and Article 3.1 Paragraphs F and G added.

Section 01721M Article 1.2 replaced.

Section 02842M Article 1.3 Paragraph C and Article 2.1 Paragraph A replaced.

Section 13551M Article 1.3 replaced, Article 2.1 replaced, Article 3.3 Paragraph C replaced, Article 3.5 Paragraph C replaced, and Article 3.5 Paragraph D added.

Section 13552M Article 1.1 Paragraph A replaced, Article 1.3 replaced, Article 2.2 through Article 2.6 replaced, Article 2.8, Paragraph C added, and Article 3.2 replaced.

Section 13553M Article 1.2 paragraphs I and J replaced, Article 1.3 replaced, Article 2.1 Paragraphs H and I replaced, Article 3.1 Paragraph F replaced, Article 3.1 Paragraph Q3 replaced, Article 3.2 Paragraph A replaced, Article 3.3 Paragraph F replaced, Article 3.4 Paragraph C added, and Article 3.5 Paragraph C added.

Section 13554M Article 2.2 replaced and Article 3.1 Paragraph N through H replaced.

Section 13555M Article 1.3 Paragraph E added, Article 2.1 Paragraph A replaced, Article 3.1 Paragraph D deleted, Article 3.2 Paragraphs C, G, and H replaced, Article 3.4 replaced, and Article 3.6 Paragraphs A and B replaced.

Section 13556 Entire section revised.

Section 13561M Article 2.1 Paragraph K added, Articles 3.1 Paragraphs E through G replaced, and Article 3.2 Paragraph A replaced.

Section 13594M Article 2.3 Paragraph A replaced, Article 2.3 Paragraph C replaced, Article 2.4 replaced.

## **Issue Date: November 9, 2005**

Revised October 27, 2005

Section 00725M Article 1.2, paragraph B added, Article 1.4 replaced.

Section 02745 Entire section originally revised July 12, 2005. This change corrected error in Table 13, Float Test.

## **Issue Date: March 2, 2006**

Revised February 23, 2006

Section 00555M Article 1.6, paragraph A replaced.

Section 00725M Article 1.2, paragraph B added, Article 1.4 replaced, Article 1.18 Paragraph C1 added, article 1.18 Paragraph D replaced, and Article 1.18 Paragraphs E – I replaced. **(Replaces Supplemental Specification 00725M issued November 9, 2005.)**

Section 00820M Article 1.2 replaced, Article 1.15 replaced, and Article 1.16 replaced.

Section 01280M Article 1.3 replaced and Article 1.10 deleted.

Section 01574M Article 1.1 replaced, Article 1.3 Paragraph B added, Article 1.4, paragraph B1 added, Article 3.1 Paragraphs F and G added, and Article 3.4, paragraph A replaced. **(Replaces Supplemental Specification 01574M issued September 12, 2005.)**

Section 01721M Article 1.1, Paragraph A replaced, Article 1.2 replaced, Article 1.5, Paragraph F and G replaced, Article 3.3, Paragraph C deleted, and Article 3.11 replaced. **(Replaces Supplemental Specification 01721M issued September 12, 2005.)**

Section 02317 Entire section revised.

Section 02748M Article 2.1, Paragraph A replaced, Article 2.2, Paragraph A replaced, and Article 3.2 replaced.

## **Issue Date: May 2, 2006**

Revised April 27, 2006

Section 02633 New section added.

Section 13557 Entire section revised. Title changed.

## **Issue Date: July 11, 2006**

Revised June 29, 2006

Section 01452M Article 1.5, paragraph B replaced, Article 3.1 Paragraph B item 1 replaced, and Table 1 replaced.

Section 01455 Entire section revised.

Section 01561 Deleted by change to Section 01571.

Section 01571 Entire section revised. Deleted Sections 01561 and 01574.

Section 01574 Deleted by change to Section 01571.

Section 02610 Entire section revised.

Section 02645 Entire section revised. Title changed.

Section 02896M Article 3.1, paragraph A replaced, Article 3.3, paragraph C7 added, and Article 3.3, paragraph E replaced.

## **Issue Date: September 11, 2006**

Revised August 31, 2006

Section 02373M Article 1.3, Paragraph C deleted and Article 2.1 replaced.

Section 02613 Entire section revised.

Section 02741M Table 6 replaced.

Section 02785 Entire section revised. Replaced Supplemental Specification 02785M.

Section 02969 Entire section revised.

Section 03311M Table 1 replaced.

Section 03412M Article 3.2, Paragraph E replaced. Previously issued Supplemental Specification incorporated.

## **Issue Date: December 18, 2006**

Revised November 30, 2006

Section 00555 Entire section revised. Replaced Supplemental Specification 00555M.

Section 00570 Entire section revised.

Section 00725 Entire section revised. Replaced Supplemental Specification 00725M.

Section 00727 Entire section revised.

Section 01282 Entire section revised. Replaced Supplemental Specification 01282M.

Section 01284 Replaces previously issued Supplemental Specification that added Section 01284. Article 1.2, Paragraph B modified and Paragraph D deleted.

Section 01561 Section deleted per Supplemental Specification 01571 issued July 11, 2006. Delayed issue, Supplemental for Section 01561 not previously issued.

Section 01574 Section deleted per Supplemental Specification 01571 issued July 11, 2006. Delayed issue, Supplemental for Section 01574 not previously issued.

Section 02056 Entire section revised. Name of section changed and Sections 02061, 02324, and 02330 deleted.

Section 02061 Section deleted per Supplemental Specification 02056.

Section 02324 Section deleted per Supplemental Specification 02056.

Section 02330 Section deleted per Supplemental Specification 02056.

Section 02844 Entire section revised.

## **Issue Date: March 8, 2007**

Revised February 22, 2007

Section 01284 Replaces previously issued Supplemental Specification that added Section 01284 and one that modified Article 1.2, Paragraph B and deleted Paragraph D. Latest change Article 1.4, Paragraph A replaced.

Section 02754 Entire section revised.

Section 02765 Entire section revised.

Section 02843 Entire section revised.

Section 02892 Entire section revised.

Section 13551 Entire section revised. Replaced Supplemental Specification 13551M.

Section 13552M Articles 1.1, Paragraph A, 1.3, 1.4, 2.2 - 2.6, 3.1, Paragraph A, C, and F, 3.2, 3.4 Paragraph C, 3.8, Paragraphs B - E, 3.9, Paragraphs B and C, and 3.11, Paragraph B replaced. Article 2.7, Paragraph B deleted, and Article 2.8, Paragraph C added.

Section 13553 Entire section revised. Replaced Supplemental Specification 13553M.

Section 13554 Entire section revised. Replaced Supplemental Specification 13554M.

Section 13555M Articles 1.2, 1.3, Paragraph E, 2.1, Paragraph A, 2.2, Paragraph B, 2.7, 3.1, Paragraph C, 3.2, 3.3, Paragraph E, 3.4, and 3.6, Paragraphs A and B replaced. Article 2.4, Paragraph B and 3.3, Paragraph F added. Article 3.1, Paragraph D deleted.

Section 13561 Entire section revised. Replaced Supplemental Specification 13561M.

Section 13591M Articles 3.1, Paragraph A, 3.2, Paragraphs D, E, and G, 3.3, Paragraphs A, E, F, I, and J, and 3.4, Paragraphs A and B replaced. Articles 1.3, Paragraph B and 3.3, Paragraph L deleted.

Section 13592 Entire section revised.

Section 13594 Entire section revised. Replaced Supplemental Specification 13594M.

Section 13595 Entire section revised.

## **Issue Date: May 10, 2007**

Revised April 26, 2007

Section 00120 Entire section revised.

Section 00515 Entire section revised.

Section 00820 Entire section revised. Replaced Supplemental Specification 00820M.

Section 01280 Entire section revised. Replaced Supplemental Specification 01280M.

Section 01452 Entire section revised. Replaced Supplemental Specification 01452M.

Section 02056 Entire section revised. Replaced Supplemental Specification 02056.

Section 02332 Section deleted per Supplemental Specification 02056.

Section 02455 Entire section revised.

Section 02466 Entire section revised.

Section 02721 Entire section revised.

Section 02746 Entire section revised.

Section 02749 Section deleted.

Section 02754 Entire section revised. Replaced Supplemental Specification 02754.

Section 02785 Entire section revised.

Section 02891 Entire section revised.

Section 02982 Entire section revised.

Section 03575 Entire section revised.

**Supplemental Specification  
2005 Standard Specification Book**

**SECTION 00120**

**BIDDING REQUIREMENTS AND CONDITIONS**

**Delete Section 00120 in its entirety and replace with the following:**

**PART 1      GENERAL**

**1.1      RELATED SECTIONS**

- A.      Section 01455: Material Quality Requirements

**1.2      REFERENCES**

- A.      Sherman Antitrust Act
- B.      United States Department of Treasury Circular
- C.      Utah Administrative Code

**1.3      PREQUALIFYING BIDDERS**

- A.      Meet Department requirements for prequalification before submitting a proposal on all projects where the Department Engineer's advertised Estimate is greater than or equal to \$1,500,000.
  - 1.      Submit prequalification information at least 10 calendar days before submitting a proposal on projects requiring prequalification.
- B.      Prequalify at least once each year.
  - 1.      The Department may change a bidder's prequalification status at any time based upon the submission of additional favorable reports or evidence of unsatisfactory performance.
  - 2.      The prequalification amount limits bidding to individual contracts of a given size or for a particular type of work.



- C. Provide experience information on the Contractor's Application for Prequalification and a confidential financial statement attested to by a certified public accountant.
  - 1. Include a complete report of the bidder's financial resources and liabilities, equipment, work history, and personnel. The Department establishes prequalification amount and work classification.

#### **1.4 BIDDING DOCUMENTS**

- A. Prequalified bidders must acquire and submit all proposals in the identical name used on their prequalification statement, or in accordance with a filed affidavit of change in firm name or ownership.
- B. Obtain bidding documents and instructions from the UDOT website. Refer to this Section, article 1.10.

#### **1.5 JOINT VENTURE BIDDING**

- A. Before submitting a joint proposal on a single project, and at least four working days before the bid opening, submit a letter of intent to the Department's Prequalification Board Secretary indicating the exact name of the joint venture and the designated administrative partner. The Department will consolidate individual prequalification amounts for the joint venture bid.
  - 1. Obtain the following under the joint venture designation before bid opening:
    - a. Contractor license
    - b. Bid bond
    - c. Bid vault certificate
    - d. UDOT Contractor identification, password, and electronic signature

#### **1.6 PROPOSAL CONTENT**

- A. The Department's proposal will state or include the following:
  - 1. Project location and description.
  - 2. Estimate of various item quantities and materials to be furnished.
  - 3. Schedule of items for unit bid pricing.
  - 4. Time for completing work.
  - 5. Proposal guaranty amount.
  - 6. Date, time and place of bid opening.
  - 7. Basis for proposal comparison, if it is other than total cost.
  - 8. Contract requirements not contained in the standard specifications.
  - 9. DBE requirements, when applicable.

10. Date, time, and location for Mandatory Pre-bid Conference, when applicable.
- B. The Department considers all documents designated in the proposal as part of the proposal.

## **1.7 INTERPRETING PROPOSAL QUANTITIES**

- A. Submit unit bid prices for the estimated quantities.
  1. Quantities may increase, decrease, or be eliminated under the contract.
  2. The Department pays for actual quantities of work performed and accepted, and materials furnished under the contract.

## **1.8 BUY AMERICA REQUIREMENTS**

- A. Refer to Section 01455.

## **1.9 EXAMINATION OF DOCUMENTS AND WORK SITE**

- A. Carefully examine the contract documents and perform a reasonable site investigation before submitting a proposal.
  1. The bidder is responsible for all site conditions that should have been discovered had a reasonable site investigation been performed.
  2. A reasonable site investigation includes investigating the project site, borrow sites, hauling routes, and all other locations related to the performance of the work.
  3. Submitting a proposal is considered an affirmative statement that the bidder has examined the contract documents and project site, investigated the nature and location of the work, and is satisfied as to the character, quality, and general and local conditions to be encountered that can affect the work or its cost and the requirements of the proposed contract, including, but not limited to:
    - a. Conditions bearing upon transportation, disposal, handling, and storage of materials.
    - b. The availability of labor, water, electric power, and roads.
    - c. Uncertainties of weather, river stages, irrigation channel flow, lake and reservoir levels, or similar physical conditions of the ground.
    - d. The type of equipment and facilities needed preliminary to and during work performance.
    - e. The character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is ascertainable from an inspection of the site, as well as from the drawings and specifications and all exploratory work made available by the Department.

- B. All Department boring logs and other records of subsurface investigations are available for information purposes only and are not substitutes for the bidder's own investigation, interpretation, and judgment. It is understood such information was obtained and used for Department design and estimating purposes only.
- C. The bidder is permitted to converse with Department personnel knowledgeable of the project, plans, specifications, materials sites, or conditions generally prevailing in the area of the proposed work to aid in pre-bid investigations.
  - 1. The Engineer is available by appointment.
  - 2. The Department is bound only by written statements, representations, or descriptions of conditions and work. No oral explanations or instructions are binding.
- D. Request explanations of the written proposal documents by contacting the Engineer 14 calendar days before bid opening to allow a reply before proposal submission.
  - 1. The Department responds to requests to all prospective bidders by certified letter or electronic communication before the specified time for bid opening.
- E. Immediately notify the Department of any apparent error, omission or ambiguity in the bid package.
- F. Failure to take the actions described and acknowledged in this article does not relieve the Contractor of the responsibility for estimating the difficulty and cost of successfully performing the work, or from proceeding to successfully perform the work without additional cost to the Department.

## **1.10 PREPARING THE PROPOSAL**

- A. Obtain UDOT's current version of the Electronic Bid System (EBS) from the UDOT website. Refer to <http://www.udot.utah.gov/main/f?p=100:pg:2229786104579395766:::1:T,V:719>.
  - 1. Contact the UDOT Construction Division for Contractor ID and EBS training.
- B. Prepare and electronically submit proposals using the Department's current EBS before the specified bid opening date and time.
  - 1. Complete all electronic bid documents specified on the Bid Submission Check List and Forms.
  - 2. Confirm receipt of addenda.
- C. When the proposal permits a choice of alternate items, indicate the choice in the EBS. The program will not permit an additional choice.

- D. Save electronic bid documents until the contract has been awarded.
- E. Provide the name and address of the individual signing the proposal as well as the following names and addresses, as applicable.

**Table 1**

<b>Individuals Signing Proposal</b>	
<b>Type of Bidder</b>	<b>Names and Office Addresses Required</b>
Individual	Individual and Post Office address
Partnership	Each Member of the Partnership and each Post office address
Joint Venture	Each Member or officer of Firms represented and each post office address
Corporation	Corporation Name and corporate address

- F. By signing the Bid Report (electronically or manually), bidders certify they understand and are in compliance with all terms and conditions of the contract.

#### **1.11 CERTIFYING NON-COLLUSIVE BIDDING**

- A. Each bidder and each person signing on behalf of any bidder certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief:
  - 1. The prices in the proposal have been arrived at independently without collusion, consultation, communication, or agreement with any other bidder or competitor for the purpose of restricting competition.
  - 2. Unless required by law, the prices that have been quoted in the proposal have not been and will not be knowingly disclosed by the bidder, directly or indirectly, to any other bidder or competitor before bid opening.
  - 3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a proposal for the purpose of restricting competition.
  - 4. The named Contractor has not, whether directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action to restrain free competitive bidding in connection with this proposal.
- B. The Department will not consider a proposal for award, nor will it make any award where there has not been compliance with this article, except as follows:
  - 1. If the bidder cannot make the foregoing certification, the bidder must furnish with the proposal a signed statement that describes in detail the reasons why the certification cannot be made.

2. The Executive Director, or designee, determines that such disclosure was not made for the purpose of restricting competition.
- C. Any of the following does not constitute a disclosure within the meaning of this Section, article 1.11, paragraph A1:
1. A bidder has published price lists, rates, or tariffs covering items being procured.
  2. A bidder has informed prospective customers of proposed or pending publication of new or revised price lists for such items.
  3. A bidder has sold the same items to other customers at the same prices being bid.
- D. A proposal made by a corporation is considered authorized by the board of directors of the bidder. Authorization is defined as signing and submitting the proposal, and includes the declaration of non-collusion on the part of the corporation.
- E. UTAH DEPARTMENT OF TRANSPORTATION NON-COLLUSIVE BIDDING CERTIFICATION
- “I declare under penalty of perjury under the laws of the United States and the State of Utah that neither I, nor to the best of my knowledge any member or members of my firm or company have either directly or indirectly restrained free and competitive bidding on this project by entering into any agreement, participating in any collusion, or otherwise taking any action unauthorized by the Utah Department of Transportation, with regard to this Contract.”
- F. Signing the Bid Proposal (manually or electronically) certifies compliance with all provisions of this Non-Collusive Bidding Certification.

## **1.12 ACCEPTANCE OF PROPOSALS**

- A. The Department reserves the right to disqualify a bidder as non-responsive or refuse a proposal for any of the following reasons:
1. Proposal does not acknowledge receipt of addenda.
  2. Award of additional work could impede or prevent timely completion of work currently under contract.
  3. Failure to pay or settle all outstanding labor and material bills or claims for a contract current at the time the proposal is issued.
  4. More than one proposal for the same work is submitted from an individual, firm, or corporation under the same or different names.
  5. Default under previous contracts.
  6. Unsatisfactory performance on previous or current contracts
  7. Debarment by the Department, any State, or the Federal Government.

8. Serious misconduct that adversely affects the ability to perform future work.
  9. Failure to reimburse the Department for monies owed on any previously awarded contract, including any contract where the prospective bidder was a party to a joint venture that failed to reimburse the Department.
  10. Bid Guaranty received after date and time specified.
  11. Non-attendance of a mandatory pre-bid meeting.
  12. Proposal received after date and time for bid opening.
  13. Manually submitted delivered diskette is blank or unreadable.
  14. Proposal not submitted using UDOT's current EBS program.
- B. If the Department refuses to accept a proposal for any of the foregoing reasons, the bidder may appeal in writing to the UDOT Deputy Director pursuant to administrative rules regarding administrative procedures and appeals as set forth in Utah Administrative Code R907-1, as amended.

### **1.13 IRREGULAR PROPOSALS**

- A. The Department considers a proposal irregular and rejects the proposal as non-responsive if:
1. Not properly signed.
  2. The Contractor is not prequalified or there is an insufficient amount of prequalification or unauthorized work classification.
  3. Unauthorized additions, conditional or alternate bids, or other irregularities make the proposal incomplete, indefinite, or ambiguous.
  4. Added provisions reserve the bidder's right to accept or reject an award, or to enter into a contract following award.
    - a. This does not exclude a proposal limiting the maximum gross award amount acceptable to any one bidder at any one bid letting. The Department selects which contracts to award.
  5. It lacks required bid documentation escrow, when applicable.
  6. Noncompliant with any prequalification regulations.
  7. It fails to furnish a properly executed proposal guaranty in accordance with this section.
  8. There is evidence of collusion among bidders.
  9. The proposal does not comply with conditions of current special provision for certification of Affirmative Action (DBE).
  10. It omits a unit price for any estimated pay item, except for authorized alternate bid items.
  11. It is materially unbalanced.
  12. The proposal does not have a Status of Work Under Contract if required, reflecting the Contractor's current prequalification status or:
    - a. Is incomplete and improperly executed.

- b. The sum of the amount of all uncompleted work plus the estimate of the amount of work bid exceeds the amount for which the Contractor is prequalified.
- 13. The proposal fails to meet any other material requirement of the invitation for bids.

#### **1.14 PROPOSAL GUARANTY**

- A. Provide a proposal guaranty in the form an electronic guaranty bond, or provide evidence of securing a cashier's or certified check, for not less than 5 percent of the total amount of the bid made payable to the Utah Department of Transportation and issued from a surety company listed on the United States Department of Treasury Circular 570 before the specified date and time for bid opening.
  - 1. Use UDOT approved surety clearing house for electronic guaranty bond.
  - 2. Use current version of the UDOT EBS program.
  - 3. Apparent low bidder delivers proposal guaranty in the form of cashier's or certified check within three calendar days of bid opening.

#### **1.15 PROPOSAL DELIVERY**

- A. Electronically transmit the proposal before the time specified in the Notice to Contractors.
- B. A manually delivered proposal takes precedence over an electronically delivered proposal.

#### **1.16 WITHDRAWAL OR REVISING PROPOSALS**

- A. A proposal may be withdrawn or revised before the time set for receiving proposals.
- B. Provide the request for withdrawal to the Department with a telephone call followed by documented electronic communications including a company authorized signature and the UDOT Contractor ID before the time set for receiving proposals.

#### **1.17 COMBINATION OR CONDITIONAL PROPOSALS**

- A. Proposals may be issued for projects in combination or separately.
  - 1. Proposals may be submitted either on the combination or on separate units of the combination.

2. The award of combination proposals or separate proposals is made to the advantage of the Department.
  3. The Department will consider only proposal combinations that it specifies.
  4. The Department writes separate contracts for each individual project included in the combination.
- B. The Department considers conditional proposals only when specified in the advertisement.

## **1.18 PUBLIC OPENING OF PROPOSALS**

- A. Proposals will be downloaded from the third party repository and publicly opened at the time indicated in the invitation for bids.

## **1.19 DEBARMENT**

- A. The Department may debar a Contractor from performing any work on Department or Department administered projects if:
1. The Contractor or an affiliate (defined as an owner, director, manager, officer or fiscal agent of the Contractor) has been convicted of or entered a plea of guilty or *nolo contendere* to a bid-related or a contract-related crime in any Court of competent jurisdiction.
  2. The Contractor or an affiliate has made a public admission of any bid-related or contract-related crime.
  3. The Contractor or an affiliate has falsified information or submitted deceptive or fraudulent statements in connection with prequalification, bidding, or performance of a contract.
  4. The Contractor or an affiliate has violated relevant antitrust laws covering bid rigging, collusion or restraint of free competition among contractors; (Violations covered by the Sherman Antitrust Act, 15 U.S.C. 1, *et seq.* and Title 76, Chapter 10, Section 911, *et se.*, U.C.A. 1953, as amended).
  5. The Contractor or an affiliate has demonstrated willful wrongdoing reflecting a lack of integrity in bidding or performing public projects.
  6. The Contractor, joint venturer, stockholder of 5 percent or more of the contract, an affiliate, or any immediate relatives of the aforementioned, has been debarred or affiliated with another debarred person or contractors by the Federal Government or by another State government.
  7. The UDOT Deputy Director has reasonable grounds to believe and finds that the Contractor has acted in collusion with others to perform work on a project that supposedly satisfies disadvantaged business enterprise goals or requirements through other than *bona fide* disadvantaged business entities in any combination of individuals, firms or corporations.
  8. The Contractor or affiliate has defaulted under previous contracts.



9. The Contractor or affiliate has unsatisfactory performance on previous work or current contract(s) consisting of, but not limited to:
  - a. Noncompliance with contract.
  - b. Failure to complete work on time.
  - c. Instances of substantial corrective work before acceptance.
  - d. Instances of completed work that requires acceptance at reduced pay.
  - e. Production of non-specification work or materials, and when applicable, required price reductions or corrective work.
  - f. Failure to provide adequate safety measures and appropriate traffic control that endangered the safety of the workforce and public.
10. The Contractor or an affiliate has questionable moral integrity as determined by the Department, the Attorney General of Utah or the Attorney General of the United States.
11. Failure to reimburse the State for monies owed on any previously awarded contract including those where the prospective bidder is a party to a joint venture and the joint venture has failed to reimburse the State for monies owed.
12. The UDOT Deputy Director has reasonable grounds to believe and finds that the public health, welfare or safety imperatively requires such action.

#### **1.20 STATUS PENDING DEBARMENT**

- A. The Contractor notified of proposed debarment as provided above is not permitted to contract with the Department, nor act as a subcontractor unless a request for either an informational or formal hearing is pending.
  1. However, if the Department's Deputy Director believes there is probable cause that a Contractor has engaged in activity that would, if true, lead to debarment under Utah Admin. Code R907-67-1, the Deputy Director may suspend the Contractor from consideration for award of contracts.
    - a. A contractor who is suspended may not submit a bid on any Department proposals, nor act as a subcontractor for the duration of suspension.
    - b. The duration of the suspension is for the greater of:
      - 1) Three months
      - 2) The duration of the Contractor's appeal
- B. The proposed debarment period does not begin until the Department decision has been issued following the said hearing or hearings.

#### **1.21 LENGTH OF DEBARMENT**

- A. Debarment is for a term of not less than six months and up to three years as determined by the Deputy Director.

- B. The Department may adjust the period of debarment for mitigating circumstances including but not limited to the following:
  - 1. Degree of culpability.
  - 2. Restitution of damages to the State.
  - 3. Cooperation in the investigation of other bidding crimes.
  - 4. Disassociation with those involved in bidding crimes.
  - 5. Protection of the State that may be required.
  - 6. If such action would have unintended adverse consequences on competition.
- C. Debarment in no way affects the obligation of a Contractor to the Department to perform under existing contracts.
- D. The Department also reserves the right to declare a debarred Contractor in default on any existing contracts for adequate cause as provided in such contracts.

## **1.22 DEBARMENT PROCEDURES**

- A. The procedure described in this Section, article Debarment applies if it is found that a Contractor or an affiliate thereof is violating the prohibited activities.
- B. The Director for Construction and Materials notifies the Contractor in writing and by certified mail of the Department's intention to debar. Written notice specifies:
  - 1. The grounds for such intended debarment.
  - 2. The date debarment becomes effective and the intended period of debarment.
  - 3. The procedure to follow if the Contractor desires to challenge the debarment or to offer information to the Department in mitigation of its alleged actions.
- C. Within 15 calendar days of receiving the notice of intended debarment, the Contractor may request either:
  - 1. An investigative hearing before the Director for Construction and Materials.
  - 2. An informal administrative hearing before the UDOT Deputy Director.
- D. The Contractor who elects to proceed at an investigative hearing has the opportunity to appear at a mutually agreed upon time and location.
  - 1. The Contractor may supply information in support of their position and has the opportunity to review the Department's evidence, present evidence, and discuss matters informally.
  - 2. No legal counsel is permitted for either party at the informal hearing.

- E. The UDOT Deputy Director of Transportation or designee conducts the informal administrative hearing with assistance from Department staff as required. The Contractor who appears may be represented by counsel and has the opportunity to review the Department's evidence, and to present evidence in rebuttal either by sworn affidavit or by sworn testimony.
- F. Following either hearing, the Department representative conducting the hearing issues a written decision no later than 30 calendar days following the hearing.
- G. If the Director for Construction and Material's decision is to be appealed, the Contractor files notice in writing with the UDOT Deputy Director within 20 calendar days after receiving the decision from the Director for Construction and Materials. The Deputy Director then schedules a formal hearing as specified above.
- H. The decision of the UDOT Deputy Director following an informal hearing is administratively final and specifies the facts justifying the Department's actions and conclusion.

<b>PART 2</b>	<b>PRODUCTS</b>	<b>Not used</b>
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<b>PART 3</b>	<b>EXECUTION</b>	<b>Not used</b>
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END OF SECTION

**Supplemental Specification  
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**SECTION 00515**

**CONTRACT AWARD AND EXECUTION**

**Delete Section 00515 in its entirety and replace with the following:**

**PART 1      GENERAL**

**1.1      RELATED SECTIONS**

- A.      Section 00570: Definitions

**1.2      REFERENCES**

- A.      United States Department of Treasury Circular

**1.3      CONSIDERATION OF PROPOSALS**

- A.      The Department publicly opens properly executed proposals using the current version of the EBS to compare bids on the basis of the summation of the products of the quantities and the unit bid prices.
  - 1.      The Department makes the results of the comparisons available to the public.
  - 2.      The unit bid prices govern if a discrepancy exists between unit bid prices and extensions.
- B.      The Department reserves the right to reject any or all proposals, waive technicalities, or advertise for new proposals.
- C.      The bidder can request withdrawal of a bid after bid opening by:
  - 1.      Submitting to the Director for Construction and Materials a notarized affidavit within 24 hours after bid opening declaring a clerical or mathematical error in bid preparation.
  - 2.      Submitting accompanying declaration with original work sheets used in bid preparation.
  - 3.      Describing specific errors in detail.
  - 4.      Verifying that error has a significant monetary effect in the amount of 3 percent of the bid or greater.

- D. The bidder may not request bid withdrawal for judgmental errors.

#### **1.4 AWARDING THE CONTRACT**

- A. The Department awards the contract to the lowest responsible bidder within 30 calendar days.
- B. The Department may withhold award beyond the 30 calendar days with the approval of the successful bidder.
- C. If the award is not made within 30 calendar days, the bidder may withdraw the proposal without liability.
- D. The Department notifies the successful bidder by letter mailed to the address shown on the proposal that the bid has been accepted and the contract has been awarded.

#### **1.5 CANCELING THE AWARD**

- A. The Department reserves the right to cancel the award of any contract before execution without liability.

#### **1.6 RETURNING PROPOSAL GUARANTY**

- A. Proposal guaranties are returned after satisfactory contract bonds and all insurances have been furnished and the contract has been executed.
- B. A bidder is not released from the bidding obligation because of an alleged error in the preparation of the proposal unless the Department returns the proposal guaranty.

#### **1.7 CONTRACT BONDS**

- A. The Department furnishes required contract bond forms.
- B. Return executed forms to the Department as required by the Utah Procurement Code.
  - 1. **Payment Bond** secures the payment of the claims of laborers, mechanics or materialmen employed on the work under the contract.
  - 2. **Performance Bond** guarantees the faithful performance of the contract.
- C. Each bond must equal 100 percent of the contract price.

- D. Underwriting Limitation is stated in the United States Department of Treasury Circular 570; Surety Companies Acceptable on Federal Bonds. Only companies listed in the Department of Treasury Circular 570 are acceptable.
- E. The Department may make alterations, extensions of time, extra and additional work, and other changes authorized by the contract without securing the consent of the surety or sureties on the contract bonds.
- F. If a Contractor's surety is unable to provide payment, the Department cancels all work on the contract, unless the Department determines it is in the public interest to continue the work.
- G. As an alternate contract bond, furnish a cash bond of two cashier's checks, each in the amount of Contractor's bid amount.
  - 1. The Department holds the cash bond and uses it when needed for correction of any non-performance or non-payment.
  - 2. Upon release by the Engineer for satisfactory completion of the work, the Department returns to the Contractor one half of the cash bond minus any cost against the bond.
  - 3. If no payment claims have arisen within 90 calendar days after release by the Engineer, the Department releases the remaining cash bond.
  - 4. The Department holds the cash bond until the non-performance and non-payment issues are resolved. Contractor accrues no liability during this time.
  - 5. The Department decides the need for withholding the cash bond.

## **1.8 EXECUTING AND APPROVING THE CONTRACT**

- A. Return the signed contract, properly executed contract bonds, and all required insurances to the Department within 15 calendar days after notice of award.
  - 1. The bidder can withdraw the proposal without penalty if the Department does not execute the contract within 30 calendar days after receiving signed contracts and bonds and insurances.
  - 2. The contract is not considered in effect until executed by all parties.

## **1.9 MATERIALS GUARANTY**

- A. The successful bidder must:
  - 1. Furnish a complete statement of the origin, composition, and manufacturer of material proposed for use in the construction.
  - 2. Furnish samples to be tested and inspected for meeting the contract.

- B. Contractor may be required to furnish a written guaranty covering certain items of work for varying periods of time from the date of acceptance of the contract.
  - 1. The Department specifies in the contract the work to be guaranteed, the form, and the time limit of the guaranty.
  - 2. Sign and deliver the guaranty to the Engineer before acceptance of the contract in accordance with Section 00570.
  - 3. Upon completion of the contract, the required performance bond may be reduced to conform to the total amount of the contract bid prices for the items of work to be guaranteed. This amount continues in full force and effect for the duration of the guaranty period. Refer to this Section, article 1.7.

#### **1.10 FAILURE TO EXECUTE CONTRACT**

- A. The Department can cancel the notice of award and keep the proposal guaranty if the successful bidder does not execute the contract and file acceptable bonds and insurance certificates evidencing coverage within 15 calendar days after the date of the Notice of Award.
- B. The Department may then award the contract to the next lowest responsible bidder, or may re-advertise the work.

#### **1.11 ESCROW OF BID DOCUMENTATION**

- A. If specified, submit with the proposal a legible copy of the bid documentation, as defined in Section 00570. Meet the following:
  - 1. Submitting and Returning Bid Documentation
    - a. Submit bid documentation in a sealed container clearly marked "Bid Document" and labeled with the bidder's name and address, submission date, and project number.
    - b. Bid documentation is returned to all but the successful bidder after the contract has been executed.
  - 2. Affidavit
    - a. In addition to bid documentation, submit a signed and certified affidavit that lists each bid document submitted by author, date, nature and subject. The affidavit must attest that:
      - 1) The affiant has examined the bid documentation and that the affidavit lists all documents used to prepare the bid.
      - 2) The sealed container contains all such bid documentation

3. Duration and Use
  - a. After executing the contract, the Department and the Contractor must jointly deliver the sealed container and affidavit to a bank or other Department-designated bonded document depository for safekeeping in a safety deposit box, vault, or other secure accommodation.
  - b. The document storage agreement must indicate that the bid documentation and affidavit will remain in escrow during the life of the contract or until the Contractor notifies the Department of its intent to file a claim or initiate contract-related litigation against the Department. Such action is sufficient ground for the Department to obtain the release and custody of the escrowed bid documentation.
  - c. Absent a claim or notice of the Contractor's intent to file a claim, the Department will direct the depository to release the sealed container to the Contractor provided the Contractor signs the final standard release form.
  - d. Certifying that the materials in escrow represent all documentation used to prepare the bid waives the Contractor's rights to use bid documentation other than those in escrow, should contract disputes arise.
4. Refusal or Failure to Provide Bid Documentation
  - a. Failure to provide bid documentation renders the bid nonresponsive.
5. Confidentiality
  - a. Materials held in escrow remain the property of the Contractor unless the Department receives the Contractor's notification of intent to file a claim or litigation ensues. If either occurs, the materials become the property of the Department until the claim is resolved or litigation is concluded.
  - b. Originals and copies of escrow materials will be returned to the Contractor once litigation is concluded, outstanding claims are resolved, or final release is executed.
  - c. The Department will make every reasonable effort to ensure the confidentiality of bid documentation to the extent allowed by the Governmental Records Access and Management Act, Title 63, Title 2, Utah Code Annotated.
6. Cost and Escrow Instruction
  - a. The Department will pay to store all escrowed materials and will provide escrow instructions to the depository.
7. Payment
  - a. Include within the overall contract bid price all costs to comply with this article.



**PART 2      PRODUCTS      Not used**

**PART 3      EXECUTION      Not used**

END OF SECTION

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**SECTION 00820**

**LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC**

**Delete Section 00820 in its entirety and replace with the following:**

**PART 1      GENERAL**

**1.1      RELATED SECTIONS**

- A.      Section 00555: Prosecution and Progress
- B.      Section 00570: Definitions
- C.      Section 01355: Environmental Protection
- D.      Section 01554: Traffic Control

**1.2      REFERENCES**

- A.      Code of Federal Regulations (CFR)
- B.      Manual of Uniform Traffic Control Devices (MUTCD)
- C.      OSHA Safety and Health Regulations for Construction
- D.      UDOT Construction Safety and Health Manual
- E.      UDOT Owner Controlled Insurance Program (OCIP)

**1.3      OBSERVING LAWS, RULES, AND REGULATIONS**

- A.      Observe and comply with all of the following that affect the conduct of work on the project, have jurisdiction or authority over the work, or that affect individuals engaged or employed on the project:
  - 1.      Federal and State Laws
  - 2.      Local laws, ordinances, and health officials
  - 3.      Regulations, orders and decrees of bodies or tribunals having any jurisdiction or authority

4. UDOT Construction Safety and Health Manual
- B. Protect and indemnify the Department and its representatives against claim or liability arising out of or resulting from violations of any of the above listed items, whether violated by employees, agents, or contractors of the following:
    1. The Contractor
    2. Subcontractor at any tier
    3. Suppliers of materials or services
    4. Any others engaged by the Contractor
  - C. Do not require employees of the Contractor or subcontractor to work in surroundings, or under conditions that are unsanitary, hazardous, or dangerous to health or safety.
    1. Immediately correct any conditions that do not comply with the foregoing provisions.
      - a. The Engineer issues a stop work order when either site conditions and/or work practices present an imminent danger (i.e. may result in serious injury, death, or extensive property damage) until those conditions or practices are corrected.
      - b. A stop work order does not provide relief from completing the project within the specified contract completion time.
  - D. Allow access to all areas of work on the project and admit any inspector of the OSHA or other legally responsible agency involved in safety and health administration without delay and without presentation of an inspection warrant to all areas of the work and project site upon presentation of proper credentials.
  - E. Comply with Federal, State and local laws, rules, and regulations that enumerate unlawful employment practices including discrimination because of race, religion, color, sex, age, disability, or national origin, and that define actions required for Affirmative Action and Minority/Disadvantaged Business programs.
  - F. Immediately notify the Engineer in writing upon discovering any discrepancy or inconsistency between the contract and any law, ordinance, regulation, or order, except as noted in this Section, article 1.8.

#### **1.4 USING EXPLOSIVES**

- A. Comply with all laws and ordinances and specifically Title 29 CFR Part 1926 - Safety and Health Regulations for Construction (OSHA), Title 30 CFR, and the UDOT Construction Safety and Health Manual, whichever is the most restrictive, in the use, handling, loading, transportation, and storage of explosives and blasting agents.
- B. Do not endanger life, property, or work with the use of explosives.

- C. Accept liability for property damage, injury, or death resulting from the use of explosives.
- D. Notify property owners and public utility companies in the vicinity of the proposed detonation before using any explosives.

## **1.5 PROTECTING FORESTS**

- A. Perform work within or adjacent to State or National Forest under regulations of the State Fire Marshal, Conservation Commission, Forestry Department, or other authority having jurisdiction governing the protection of forests.
- B. Keep the project site orderly and clean.
- C. Obtain all required permits.
- D. Prevent and assist with the suppression of forest fires.
- E. Cooperate with responsible forestry officials.

## **1.6 PERMITS, LICENSES, AND TAXES**

- A. Acquire all permits and licenses; pay applicable charges, fees, and taxes; and give all notices necessary to perform the work.
- B. Include these costs in the appropriate unit prices bid for the contract items.

## **1.7 PATENTED DEVICES, MATERIALS, AND PROCESSES**

- A. Provide proof of legal agreement with the patentee or owner, if necessary, for use of a design, device, material, or process covered by letters, patents, or copyrights
- B. Indemnify and hold harmless the Department and any affected third party or political subdivision from claims of infringement of patents, copyrights, or trademarks.
- C. Indemnify the Department for costs, expenses, and damages, which it may be obligated to pay as a result of an infringement during the conduct of the work or after the project is completed.

## **1.8 FEDERAL AID PARTICIPATION**

- A. Federal requirements of a federally assisted contract supersede conflicting provisions of laws, rules, or regulations.
- B. The Department supervises all work but appropriate Federal officials inspect and approve the work when there is Federal participation in the contract. The U.S. Government, however, is not a party to the contract and will not interfere with the rights of contract parties.

## **1.9 PUBLIC CONVENIENCE AND SAFETY**

- A. Perform work with minimal obstruction to traffic.
- B. Follow the safety provisions of all applicable laws, rules, codes, and regulations to ensure the safety and convenience of the public and property.
- C. Provide, erect, and maintain all traffic control devices such as barriers, barricades, and warning signs in accordance with MUTCD and Section 01554 requirements to protect the work and the public safety.
  - 1. Use barriers and barricades to delineate highway sections closed to traffic.
  - 2. Illuminate obstructions during darkness and provide warning signs to control and direct traffic.
- D. Erect warning signs for work that may interfere with traffic or where new work crosses or coincides with an existing road.
  - 1. Place and maintain warning signs according to the project traffic control plan.
  - 2. Obtain approval before dismantling or removing traffic control devices.
- E. For Pedestrians:
  - 1. Place and maintain warning signs under project traffic control plan.
  - 2. Provide pedestrian access in areas where construction interferes with existing pedestrian access.

## **1.10 PROTECTING AND RESTORING PROPERTY AND LANDSCAPE**

- A. Preserve public and private property during the work.
- B. The Engineer verifies reference to the location of monuments and property line markers before they are moved, disturbed, or damaged.
  - 1. Obtain written approval from the Engineer before moving or disturbing any monuments or markers.

- C. Accept liability for any damage to public or private property resulting from defective work, materials, or non-execution of the contract.
  - 1. Maintain liability until the project is accepted.
- D. Restore damaged property to a condition similar or equal to that existing before the damage at no additional cost to the Department.
- E. Temporarily discontinue work if remains of prehistoric dwelling sites or artifacts of historical or archeological significance are encountered. Refer to Section 01355.

#### **1.11 THIRD-PARTY BENEFICIARY CLAUSE**

- A. This contract does not authorize anyone who is not a party to this contract the right to maintain an action for damages under its provisions or to any of the rights of a third-party beneficiary. However, this contract does not prohibit the parties from agreeing to provide third-party beneficiary rights to another party so long as those rights are set forth in a separate agreement and signed by all the parties to this contract and the intended third-party beneficiary.

#### **1.12 PERSONAL LIABILITY OF DEPARTMENT EMPLOYEES**

- A. The Department's authorized representatives act solely as agents and representatives of the Department when carrying out the provisions of or exercising the power or authority granted to them under the contract.
- B. They are not liable either personally or as employees of the Department for actions in their ordinary course of employment.

#### **1.13 NO WAIVER OF LEGAL RIGHTS UPON COMPLETION**

- A. Upon completion of the contract, the Department makes final inspection and notifies the Contractor of acceptance.
  - 1. Final acceptance does not prevent the Department from correcting any measurement, estimate, or certificate made before or after completion of the work.
  - 2. The Department is not prevented from recovering from the Contractor or Surety or both, overpayment sustained for failure of the Contractor to fulfill the obligations under the contract.
  - 3. A waiver from the Department for any breach of any part of the contract is not held as a waiver of any other or subsequent breach.

- B. Even after completion, assume liability to the Department for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards to the Department's rights under any warranty or guaranty without prejudice to the terms of the contract.

#### **1.14 RESPONSIBILITY FOR DAMAGE CLAIMS**

- A. To the extent allowed by law, protect, indemnify, and hold the State of Utah, the Department, and their officers, agents, and employees (State) harmless from and against all claims, demands, damages, and causes of action of every kind or character on account of bodily injuries, death, or damage to property arising out of, resulting from, or in any way connected with, the performance of the contract.
- B. Defend the Department against all third party or other lawsuits arising out of or resulting from the contract Work. The Department may require that the Contractor represent its interests or may choose to have separate counsel. If the Department has its own counsel, the Department pays for its own attorneys' fees, costs, and expenses. Upon determination by the court of the proportionate liability for the claim, total defense costs will be apportioned accordingly. For example, if the court finds the Department to be 60 percent liable for the claim and the Contractor 40 percent liable, then the Department pays 60 percent of the total defense costs while the Contractor pays 40 percent.
- C. If served with a lawsuit or Notice of Claim, Contractor and the Department agree to provide each other with a copy of the summons and complaint within two business days of receipt. Do not file a responsive pleading on behalf of the Department until receiving written notice that the Department chooses to have Contractor handle the defense. The Department will provide the Contractor such written notice in a timely manner allowing the Contractor adequate time to respond to the summons.
- D. If the parties have separate counsel, they agree to cooperate to the fullest extent possible, subject to privileges and ethical rules.
- E. Provide insurance as defined in this Section, article 1.15 from reliable insurance companies authorized to do business in Utah, rated "A" or better and with a financial size category of Class VII or larger by A.M. Best Company, at the time of contract execution.
- F. Comply with the following insurance claims notification and processing procedures:
  - 1. Notify the Engineer of all claims within seven days of notification.
  - 2. Before the final acceptance of the project provide written notification for all pending claims to the Engineer.

3. Notify claimants of denied or partially denied claims of \$5,000 or less of their right to request re-examination by the  
UDOT Claims Re-Examination Board  
4501 South 2700 West  
West Valley City, UT 84114-8430  
Phone: (801) 964-4556
    - a. The information provided to the claimant includes:
      - 1) A time deadline for requesting re-examination equal to seven days after notification of denial or partial denial
      - 2) Address and name of the person to whom it should be directed
      - 3) General information helpful in making a determination
  4. The Board can waive the time deadline.
- G. Cooperate with the UDOT Claims Re-examination Board in resolving disputes regarding denials or partial denials from an insurance carrier.
1. Provide any information possessed by the carrier that the Board believes is pertinent to the determination.
  2. The Board may refer to an insurance carrier's decision and the reason for it.
  3. The determination is based on general applicable standards of insurance adjusting.
  4. The Board does not grant in-person hearings, but relies on documentation prepared by the Contractor, the insurance carrier, the claimant, and the Department.
  5. Neither the insurance carrier nor the Contractor has the right to intervene in a re-examination before the Board.
  6. The board decides the claim as expeditiously as possible.
  7. The decision by the UDOT Claims Re-examinations Board is administratively final.
- H. The Department deducts from the Contractor's pay estimate claims that the Contractor's liability insurance carrier denied but are directed to be paid by the UDOT Claims Re-Examination Board.



## **1.15 INSURANCE REQUIREMENTS**

For projects where the Engineers Estimate is equal to or greater than \$4,000,000 and the ability to select an alternate is provided for in the EBS file, the Contractor may bid one of two insurance alternates. Alternate #2 is not applicable on projects where the Engineers Estimate is less than \$4,000,000.

### **Alternate #1:**

Provide insurance per the requirements listed in this section. Include cost for such insurance in the Contractor's bid prices. When provided for in the EBS file, selection of this alternate is indicated by entering \$1.00 in the unit price field for the Contractor supplied insurance bid item.

- A. Workers' Compensation Insurance
  - 1. Provide Workers' Compensation Insurance to cover full liability. As a minimum, comply with the statutory limits defined by the State of Utah.
- B. General Liability Insurance
  - 1. Provide General Liability insurance with the following minimum limits of liability:
    - a. \$1,000,000 Bodily Injury and Property Damage – Each Accident
    - b. \$2,000,000 General Aggregate
    - c. \$2,000,000 Products and Complete Operations Annual Aggregate
- C. Automobile Liability Insurance
  - 1. Provide Automobile Liability Insurance for claims arising from the ownership, maintenance, or use of motor vehicles involved in project work with the following minimum limits:
    - a. \$1,000,000 Combined single Limit Bodily Injury and Property Damage per Occurrence
- D. Provide the following for all required liability insurance policies:
  - 1. Where and when applicable, name as insured, only in respect to work to be performed under this contract, the State of Utah and all institutions, agencies, departments, authorities, and instrumentalities, and while acting within the scope of their duties, all volunteers as well as members of governing bodies, boards, commissions, and advisory committees.
  - 2. Coverage for the above insured is primary and not contributing.
  - 3. Incorporate into the insurance policy this statement: "Insurance coverage is extended to include claims reported up to one year beyond the date of substantial completion of this contract."

- E. Provide the Department with certificates of insurance showing that they are covered as required above before entering the project site or beginning project work. The certificates will also state that the policies required are endorsed to give the Department (the Engineer) not less than 30 days prior notice in the event of cancellation or change in coverage. Within five days of receiving written notice that the Contractor intends to cancel its insurance or change coverage to the extent that it does not comply with the contract requirements, the Department may object. If Contractor cancels coverage or changes coverage despite that objection, the Department may cancel this contract immediately or sue for an injunction or any other legal remedy to require Contractor to keep its current coverage.
- F. Regardless of the Contractor insurance requirements required in this section, insolvency, bankruptcy, or failure of any insurance company to pay all claims accrued does not relieve Contractor of any obligations.
- G. Endorse all policies to include waivers of subrogation in favor of the Department.
- H. If the Department discovers that the Contractor's policies are not endorsed to the Department, the Engineer gives the Contractor written notice that the certificates need to be modified so as to give the Department the required endorsements.
  - 1. Complete within 10 calendar days.
  - 2. Provide new certificates to the Engineer at that time.
  - 3. If certificates are not obtained, the Department may terminate the Contractor for Default as defined in Section 00555.

#### **Alternate #2**

The Contractor may elect to participate in the UDOT Owner Controlled Insurance Program (OCIP). If the Contractor selects the OCIP Alternate, insurance will be furnished at no cost to the Contractor. However, for bid comparison purposes, Contractors that select the OCIP Alternate must calculate 3 percent of the total bid price and enter that amount into their bid by inserting the 3 percent amount into the unit price field for the OCIP Alternate insurance bid item. Failure to do so will result in the bid being declared non-responsive.

- A. OCIP Alternate: Refer to UDOT Owner Controlled Insurance Program (OCIP) General Conditions for coverage limits and conditions on the UDOT website. Refer to <http://www.udot.utah.gov/main/f?p=100:pg:2229786104579395766:::1:T,V:719>.

### **1.16 SITE OF WORK**

- A. Refer to definition in Section 00570.

### **1.17 HAULING BY TRUCK**

- A. Comply with all Federal and State regulations regarding hauling.
- B. When additional trucks are needed for hauling on site only, on a Federal or State funded project, a subcontract must be in the project office before the additional trucks begin work on the project site. Hauling to the project site or away from the project site does not require a subcontract to be approved by the Engineer.
- C. When using additional trucks to fulfill the DBE goal, a subcontract approved by the UDOT engineer is required.

### **1.18 AIR QUALITY PROTECTION**

- A. Refer to Section 01355.
- B. Contact the Utah Division of Air Quality (DAQ) and obtain the appropriate Air Quality Permit for the project. Permit application forms can be obtained from DAQ's web site. Refer to <http://www.udot.utah.gov/main/f?p=100:pg:2229786104579395766:::1:T,V:719>.  
Utah Division of Air Quality  
150 North 1950 West  
PO Box 144820  
Salt Lake City, UT 84114-4810  
Phone: (801) 536-4000  
Fax: (801) 536-4099
- C. The Contractor is not allowed to proceed with work affecting air quality without an Air Quality Approval Order or Notice of Intent to Approve letter or a Temporary Approval Order for the project, process, or equipment to be used.

**PART 2 PRODUCTS Not used**

**PART 3 EXECUTION Not used**

END OF SECTION

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**SECTION 01280**

**MEASUREMENT**

**Delete Section 01280 in its entirety and replace with the following:**

**PART 1      GENERAL**

**1.1      MEASUREMENT OF QUANTITIES**

- A. All work completed under the contract is measured in U. S. standard measure.
  - 1. The Department measures and determines quantities of material furnished and work performed in accordance with the measurement and payment section of the contract.
  - 2. The methods of measurement and computations for determining quantities of material furnished and of work performed under the contract are methods generally recognized as conforming to good engineering practice.
  
- B. When the term “plan quantity” is indicated in the contract bid item designation:
  - 1. Accept the estimated quantity in the bid proposal as the final quantity for which payment will be made, unless the Engineer revises the plan dimensions through an approved change order.
    - a. The Engineer adjusts the final quantity for payment by the amount of increase or decrease to the estimated quantity in the bid proposal represented by authorized changes in dimensions.
  - 2. Request an adjustment to the final quantity for payment if an error is discovered in the estimated quantity in the bid proposal.
    - a. Provide all computations, plots, and supporting documentation necessary for the Engineer to verify the error and determine the final quantity for payment.
    - b. All work associated with providing computations, plots, and supporting documentation is at no cost to the Department, except:
      - 1) Work required to provide computations, plots, and supporting documentation may be paid for as extra work when the final quantity differs from the estimated quantity by more than 10 percent.

- C. Lump sum or each:
1. The Department measures the complete structure or structural unit, signal or lighting system, or other items of work specified in the bid proposal to be measured by lump sum or each to include all necessary work, fittings, and accessories for a complete unit or system.
- D. Length:
1. Items measured by the foot such as pipe culverts, guardrail, underdrains, etc. are measured parallel with the base or foundations upon which the structures are placed.
  2. The term “station” when used as a definition or term of measurement is 100 linear feet.
- E. Area:
1. Unless otherwise specified, the Department uses horizontal longitudinal and plan (neat) transverse measurements.
- F. Volume:
1. The Department measures structures using plan (neat) dimensions, or altered dimensions when approved by the Engineer to fit field conditions.
  2. The Department uses average end area or computer generated Digital Terrain Model (DTM) method for computing volumes of excavation.
  3. Materials specified to be measured by the cubic yard may be weighed and converted to cubic yard for payment purposes, when requested by the Contractor and approved by the Engineer in writing.
    - a. Agree to the factors for conversion from weight measurement to volume as determined by the Engineer before using this method of measurement for computing pay quantities.
- G. Weight:
1. The term “ton” means 2000 pounds avoirdupois.
  2. Measure aggregate weight in the saturated surface dry condition.
- H. Standard manufactured items such as fence, wire, plates, rolled shapes, pipe conduit, etc., identified by gauge, unit, weight, section dimensions, etc.:
1. Unless otherwise specified, the Department uses nominal weights or dimensions and industry-manufacturing tolerances.
- I. Plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing:
1. The Department measures thickness in fractions of inches.

## **1.2 WEIGHING REQUIREMENTS AND PROCEDURES**

- A. Weigh all materials that are measured or proportioned by weight, or contract items measured by the ton, such as aggregates and asphalt materials, on scales that have been approved, certified, and which meet specification requirements.
  - 1. Obtain certified haul truck tares at times as directed by the Engineer and place a legible identification mark on each truck.
  - 2. The Department may return any loads of material that appear to be deficient or questionable to be reweighed.
- B. Furnish, erect, have certified, and maintain, or use permanently installed and certified commercial scales for weighing highway and bridge construction materials that are required to be proportioned or measured and paid for by weight:
  - 1. Scales must be accurate within the limits set by the laws of the State of Utah, meeting requirements of the U.S. Bureau of Standards.
  - 2. Scales must bear a current seal of acceptance from the State of Utah Department of Agriculture, Division of Weights and Measures.
  - 3. Have the Utah State Department of Agriculture Division of Weights and Measures inspect and seal all scales at least once a year and after each setup before use, or as requested by the Engineer.
  - 4. Install and maintain platform scales with the platform level and with rigid bulkheads at each end.
    - a. Platform scales must be of adequate size and capacity so the entire power unit and hauling unit can be weighed at the same time.
  - 5. Physically arrange electronic, beam, dials, platform, and other scale equipment for convenient and safe viewing by the operator and inspector.
- C. Include costs for furnishing, installing, certifying or testing, and maintaining scales, furnishing scale house, materials for proportioning or payment, and all other items specified in this section for the weighing of highway and bridge construction materials in the unit contract prices for the various pay items of the contract.
- D. Request written approval to use alternate weighing devices.

**PART 2      PRODUCTS      Not used**

**PART 3      EXECUTION      Not used**

END OF SECTION

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**SECTION 01452**

**PAVEMENT SMOOTHNESS**

**Delete Section 01452 in its entirety and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Process and procedures for acceptance testing and determination of Incentive/Disincentive for smoothness of Hot Mix Asphalt (HMA), Open Graded Surface Course (OGSC), Stone Matrix Asphalt (SMA), and Portland Cement Concrete Pavement (PCCP) using a California type profilograph or profiler, approved and certified by the Department.

**1.2      RELATED SECTIONS**

- A.      Section 02741: Hot Mix Asphalt (HMA)

**1.3      GENERAL REQUIREMENTS**

- A.      Pavement smoothness is determined through Department inspection of Contractor testing using a California type profilograph or profiler, approved and certified by the Department.
  - 1.      Certify operators and equipment through the Department.
  - 2.      Engineer verifies certifications.
- B.      Comply with project Traffic Control Plan and all applicable safety requirements when performing testing.

## 1.4 ACCEPTANCE

- A. After all corrective work has been performed, notify the Engineer in writing at least two working days before scheduling Department inspection of acceptance testing on the final pavement surface.
  - 1. Clearly define the areas to be tested for acceptance in the written notification.
  - 2. Do not perform any work on the final surface after acceptance testing, except as directed by the Engineer.
- B. For purposes of determining incentive/disincentive, the Department evaluates the surface by section, defined as:
  - 1. Class I surface, 0.1 mile in length, including the adjacent shoulder. (Refer to Table 1 for definition of Class I surfaces). Begin the initial section at the start of the project. Lay out subsequent sections consecutively to the end of the project.
    - a. Testing consists of a single trace measurement of each wheel path, defined as a continuous parallel line 2.5 ft inside the projected lane or median lines.
    - b. Testing of adjacent shoulders having a design width of 6 ft or greater consists of a single trace measurement, approximately centered in the shoulder.
    - c. Determine the Profile Index (PI) by taking the average of all profile traces taken on the section.
      - 1) Include profile trace deviations from manholes, valves, and other facilities in the profile trace when the contract requires the adjustment or reconstruction of these facilities.
      - 2) Exclude profile trace deviations from manholes, valves, and other facilities in the profile trace when the contract does not include adjustment or reconstruction of these facilities.
      - 3) Do not measure PI for shoulders having a design width less than 6 ft
- C. The Department evaluates longitudinal and transverse deviations for both Class I and Class II surfaces. Refer this Section, article 3.1 for construction requirements.
- D. If the final lift of pavement cannot be completed due to seasonal limitations, the Department evaluates all roadway sections paved through the final lift and evaluates the remaining final lift of pavement upon completion.



## **1.5 MEASUREMENT AND PAYMENT PROCEDURE**

- A. All work necessary to prepare the pavement for testing, such as but not limited to sweeping, is incidental to the work and is not measured for payment.
  - 1. Include all costs and resources for smoothness testing, preparation and correction in the surfacing bid items.

## **PART 2 PRODUCTS**

Not Used

## **PART 3 EXECUTION**

### **3.1 HMA, SMA, AND OGSC**

- A. Construction Requirements
  - 1. Construct finished pavement to meet the surface requirements in Table 1.
  - 2. Identify defects exceeding the limits in Table 1 and correct before acceptance testing.
    - a. Analyze the profile using 0.2-inch blanking band.
    - b. Correct defects across the entire width of the traffic lane or shoulder either by grinding with a device approved by the Engineer, or by filling as directed by the Engineer.
    - c. Re-profile for correction verification before acceptance testing.
  - 3. Correct transverse defects where the pavement surface varies more than 1/8 inch from the lower edge of a 10-foot straightedge placed perpendicular to the centerline of the roadway.
  - 4. Seal areas that have been ground with asphalt tack coat.
    - a. Use a tack coat application rate between 0.07 and 0.14 gal/yd<sup>2</sup>.
  - 5. The Department inspects acceptance testing before the placement of Chip Seal Coat, when applicable.
- B. Acceptance Testing
  - 1. Perform acceptance testing in accordance with article 1.4.
    - a. Acceptance testing consists of PI determination for Class I surfaces and determination of compliance with allowable profile deviation for Class II surfaces.

2. Incentive/Disincentive - HMA
  - a. Incentive/Disincentive applies only to Class I surfaces for each pavement section defined in this Section, article 1.4, paragraph B.
    - 1) Incentive/Disincentive is calculated according to Table 2, with partial sections prorated based on length.
    - 2) Incentive/Disincentive does not apply to HMA surfaces on projects requiring OGSC or SMA.
    - 3) Any section requiring grinding exceeding 20 yd<sup>2</sup> does not qualify for incentive. Disincentive remains applicable for sections where grinding exceeds 20 yd<sup>2</sup>.
  - b. Any section still requiring corrective work that is identified at the time of acceptance testing results in loss of incentive for the section. Disincentives remain applicable and are based on PI obtained at the time of acceptance testing.
  - c. Failure to correct defects, identified at the time of acceptance testing, within 14 calendar days after notification by the Engineer results in liquidated damages assessed at \$100 per day after 14 calendar days per each section needing corrective work.
    - 1) The Engineer may waive liquidated damages when it is determined to be in the best interests of the Department to defer corrective work.
3. Incentive/Disincentive - OGSC and SMA Surfaces
  - a. Incentive/Disincentive applies only to Class I surfaces for each pavement section defined in this Section, article 1.4. Partial sections are prorated based on length and Incentive/Disincentive is calculated according to Table 3, with the following exception:
    - 1) Any section requiring grinding exceeding 20 yd<sup>2</sup> or any section still requiring corrective work that is identified at the time of acceptance testing results in a disincentive of \$1000 per section.
  - b. Failure to correct defects, identified at the time of acceptance testing, within 14 calendar days after notification by the Engineer results in liquidated damages assessed at \$100 per day per each section needing corrective work.
    - 1) The Engineer may waive liquidated damages when it is determined to be in the best interests of the Department to defer corrective work.

### **3.2 PORTLAND CEMENT CONCRETE PAVEMENT (PCCP)**

- A. Construction Requirements
  1. Construct finished pavement to meet surface requirements listed in Table 1.
  2. Identify defects exceeding the limits in Table 1 and correct before acceptance testing.

- a. Analyze the profile using 0.2-inch blanking band.
  - 3. Correct defects across the entire width of the traffic lane or shoulder by grinding with a device approved by the Engineer.
    - a. Re-profile for correction verification before acceptance testing.
  - 4. Correct transverse defects where the pavement surface varies more than 1/8 inch from the lower edge of a 10-foot straightedge placed perpendicular to the centerline of the roadway.
- B. Acceptance Testing
- 1. Perform acceptance testing in accordance with article 1.4.
    - a. Acceptance testing consists of PI determination for Class I surfaces and determination of compliance with allowable profile deviation for Class II surfaces.
  - 2. Incentive/Disincentive - PCCP
    - a. Incentive/Disincentive applies only to Class I surfaces for each pavement section defined in this Section, article 1.4, paragraph B.
      - 1) Incentive/Disincentive is calculated according to Table 4, with partial sections prorated based on length.
    - b. Any section requiring grinding exceeding 20 yd<sup>2</sup> does not qualify for incentive.
    - c. Any section still requiring corrective work that is identified at the time of acceptance testing results in loss of incentive for the section. Disincentives remain applicable and are based on PI obtained at the time of acceptance testing.
    - d. Failure to correct defects, identified at the time of acceptance testing, within 14 calendar days after notification by the Engineer results in liquidated damages assessed at \$100 per day per each section needing corrective work.
      - 1) The Engineer may waive liquidated damages when it is determined to be in the best interests of the Department to defer corrective work.

**Table 1**

<b>Surface Requirements</b>				
<b>Pavement Category</b>	<b>Class I Surface</b>		<b>Class II Surface</b>	
	<b>Section PI</b>	<b>Profile Deviation</b>	<b>Section PI</b>	<b>Profile Deviation</b>
<b>Category</b>	<b>in/mi</b>	<b>in/25ft</b>	<b>in/mi</b>	<b>in/25ft</b>
1	5	0.3	N/A	0.3
2	7	0.3	N/A	0.3
<b>Category 1</b>	National Highway System and Truck Routes (See Section 02741, Table 11) and all other routes with surfaces having three or more opportunities for improving the ride. *			
<b>Category 2</b>	All other routes incorporating single lift overlays with not more than two opportunities for improving the ride. *			
<b>Class I</b>	Surfaces longer than 1000 ft in length consisting of all traffic and climbing lanes, passing lanes, acceleration and deceleration lanes, ramps, medians wider than 8 ft, and turn lanes. Includes bridges and bridge approach slabs with final riding surfaces placed as part of the contract. Excludes horizontal curves having a centerline radius of curvature less than 900 ft and areas within the superelevation transitions to these short radius curves.			
<b>Class II</b>	Surfaces consisting of all tapers, road approaches, mainline pavement sections with posted regulatory speeds less than 35 MPH, pavement within 15 ft of bridge decks and approach slabs not paved as part of the contract, pavement to a point 50 ft beyond the paving limits of the project, and all other surfaces not included in the Class I definition.			

\* Each opportunity to improve the ride is one of the following: Placing a gravel or treated base course, OGSC, SMA, rotomilling, cold recycling, and each lift of paving. Leveling is not considered an opportunity to improve the ride.

**Table 2**

<b>HMA Incentive/Disincentive</b>	
<b>Category</b>	<b>Incentive/Disincentive per Section</b>
<b>1</b>	<b>\$60 x [(Required in/mi) - (PI)]</b>
<b>2</b>	<b>\$30 x [(Required in/mi) - (PI)]</b>

**Table 3**

<b>OGSC &amp; SMA Incentive/Disincentive</b>	
<b>Category</b>	<b>Incentive/Disincentive per Section</b>
<b>1</b>	<b>\$150 x [(Required in/mi) - (PI)]</b>
<b>2</b>	<b>\$100 x [(Required in/mi) - (PI)]</b>

**Table 4**

<b>PCCP Incentive/Disincentive</b>	
<b>Category</b>	<b>Incentive/Disincentive per Section</b>
<b>1</b>	<b>\$200 x [(Required in/mi) - (PI)]</b>
<b>2</b>	<b>\$125 x [(Required in/mi) - (PI)]</b>

END OF SECTION

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## SECTION 02056

## EMBANKMENT, BORROW, AND BACKFILL

**Delete Section 02056, 02061, 02324, 02330, and 02332 in their entirety and replace with the following: (References in other UDOT Specification Sections have not been updated.)**

## PART 1      GENERAL

### 1.1 SECTION INCLUDES

- A. Materials and procedures for construction of embankment, backfill, and bridge approach embankments.

## 1.2 RELATED SECTIONS

- A. Section 02231: Site Clearing and Grubbing
- B. Section 02317: Structural Excavation
- C. Section 02912: Topsoil
- D. Section 03575: Flowable Fill

### 1.3 REFERENCES

- A. AASHTO M 145: Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
- B. AASHTO T 11: Materials Finer than 75  $\mu\text{m}$  (No. 200) Sieve in Mineral Aggregates by Washing
- C. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates
- D. AASHTO T 99: Moisture-Density Relations of Soils Using a 2.5 kg (5.5-lb) Rammer and a 305 mm (12 in.) Drop
- E. AASHTO T 180: Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop
- F. UDOT Minimum Sampling and Testing Requirements  
Embankment, Borrow, and Backfill

## **1.4 SUBMITTALS**

- A. Before delivering material to the project, submit:
  - 1. Supplier and source of materials
  - 2. Gradation analysis AASHTO T 27 / T 11
  - 3. Soil classification when applicable AASHTO M 145
  - 4. Maximum Dry Density and Optimum Moisture Determination
    - a. Use AASHTO T 180 Method D for A-1 soils and AASHTO T 99 Method D for all other soils.

## **1.5 ACCEPTANCE**

- A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.
- B. Engineer reserves the right to select and test material randomly from any location at the construction site.
- C. Density Requirement: Acceptance is on a lot-by-lot basis when average density is not less than 96 percent of maximum laboratory density, and no single determination is lower than 92 percent.
  - 1. Use AASHTO T 180 Method D for A-1 soils and AASHTO T 99 Method D for all other soils.
- D. Remove any material found defective and replace with acceptable material at no additional cost to the Department.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. Provide materials free of contamination from chemical or petroleum products for embankment and backfill placements. Materials may include recycled Portland Cement concrete.

### **2.2 BORROW**

- A. Classifications A-1-a through A-4. Meet AASHTO M 145

### **2.3 GRANULAR BORROW**

- A. Classification A-1-a. Meet AASHTO M 145
- B. Non-plastic, well-graded, 3-inch maximum

## **2.4 GRANULAR BACKFILL BORROW**

- A. Classification A-1-a. Meet AASHTO M 145
- B. Non-plastic, well-graded, 2-inch maximum

## **2.5 EMBANKMENT FOR BRIDGE**

- A. Granular Borrow

## **2.6 FREE DRAINING GRANULAR BACKFILL**

- A. Meet the following gradation:

<b>Table 1</b>	
<b>Free Draining Granular Backfill Gradation</b>	
<b>Sieve Size</b>	<b>Percent Passing</b>
1-1/2 inch	100
1 inch	95 to 100
1/2 inch	25 to 60
No. 4	0 to 10

## **2.7 FLOWABLE FILL**

- A. Refer to Section 03575

# **PART 3 EXECUTION**

## **3.1 PREPARATION**

- A. Complete clearing and grubbing and stripping and stockpiling topsoil before placing embankment. Refer to Sections 02231 and 02912.
- B. Excavate and dispose of unsuitable material as directed by the Engineer.



### **3.2 EMBANKMENT PLACEMENT**

- A. Place roadway excavation or borrow in embankment section with the highest quality material in the top portion of the embankment.
- B. Scarify and compact the top 8 inches of the surface to at least 90 percent of maximum laboratory density when the embankment height is 6 ft or less and the underlying ground consists of loose material.
- C. Break and scarify all underlying road surfaces in so that pieces do not exceed 3 ft<sup>2</sup>.
- D. Maintain drainage.
  - 1. Grade and maintain the roadway to ensure adequate drainage.
  - 2. Maintain pipe culverts and drainage ditches, or provide temporary facilities when interrupting irrigation systems, sewer, underdrainage, etc.
- E. Place an initial layer to act as a working platform over soft, wet ground when approved by the Engineer.
  - 1. Density specifications do not apply to the working platform.
  - 2. Meet density requirements for embankment placed above the working platform.
- F. The Engineer inspects and accepts the working platform or foundation before embankment is placed.
- G. Spread embankment materials uniformly in layers not exceeding 1 ft (uncompacted depth) and compact to an average of 96 percent maximum laboratory density before placing the next layer. Reduce the lift thickness if tests show unsatisfactory density.
- H. Finish subgrade surface within  $\pm 0.1$  ft of line and grade.
- I. Do not use rock or pavement materials over 3 ft in any dimension. Distribute so space exists for placing and compacting embankment material between large rocks or pavement materials.
- J. Do not place large rock within 1 ft of the subgrade surface. Do not allow rocks to protrude above the subgrade surface.
- K. Do not use compacting equipment that causes shear failure in the embankment.

### **3.3 GRANULAR BORROW AND BACKFILL PLACEMENT**

- A. Finish granular borrow surface within  $\pm 0.1$  ft of line and grade.

- B. Structural Backfill Placement (includes bridges, foundation, box culverts, pipe culverts, drains and other structures)
  - 1. Place suitable backfill material in structural backfill sections. Refer to Section 02317.
    - a. Use granular backfill borrow when specified.
  - 2. Use appropriate compaction equipment adjacent to abutments, backwalls, approach slabs, wing walls, retaining walls, and other structures.
  - 3. Compact backfill material in 6-inch layers to a 96 percent density.
- C. Free Draining Granular Backfill
  - 1. Excavate a trench 3 inches below the underdrain pipe flow-line. Widen to 2 ft plus the outside diameter of the underdrain pipe.
  - 2. Place free draining granular backfill in the trench and compact the bottom 3 inches with two passes of a vibratory roller.
  - 3. Back fill to 12 inches above top of pipe with free draining granular backfill.
  - 4. Compact backfill material in 6-inch layers to a 96 percent density when placing under a roadway.

### **3.4 EMBANKMENT FOR BRIDGE PLACEMENT**

- A. Construct approach embankments from the original existing ground up with the specified material to the limits defined herein and in accordance with DD series Standard Drawings.
  - 1. Approach Embankments
    - a) Embankment placed beneath the bridge, except riprap or other specified materials used for MSE walls.
    - b) Embankment placed from the bridge abutment centerline station to a point measured at least 300 ft away from the abutment along the approach roadway centerline; and placed for embankment on the inside of abutments.
    - c) Where retaining walls are located beyond this delineation, use the specified material throughout the length of the walls.
  - 2. Intersecting Roadway Embankments
    - a) Embankment placed from approximate edge of approach roadway a length of at least 60 ft along intersecting roadway centerline.
  - 3. Adjoining Embankments
    - a) When adjoining embankment is not an approach embankment, embankment placed to at least 10 ft outward from edge of approach roadway pavement.
- B. Over-excavate unsuitable material (soft, springy, organic, or otherwise yielding material) at natural ground level as directed by the Engineer.

- C. The Engineer inspects and accepts the working platform or foundation before embankment is placed.
- D. Spread embankment materials uniformly in layers not exceeding 1 ft (uncompacted depth) and compact to an average of 96 percent maximum laboratory density before placing the next layer. Reduce the lift thickness if tests show unsatisfactory density.
- E. Finish surface within  $\pm 0.1$  ft of line and grade.

### **3.5 LIMITATIONS**

- A. Requirements when working during freezing or snowy conditions:
  - 1. Do not place embankment on frozen or snow-covered areas.
  - 2. Do not deliver or use frozen material in embankments.
  - 3. Remove snow and frozen material from embankments, foundations, and borrow areas, and furnish embankment material that can be compacted to the specified density.
  - 4. Remove, waste, and replace frozen embankment material at no additional cost to the Department.
  - 5. Measure wasted material and provide quantities to the Engineer.

END OF SECTION

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**SECTION 02332**

**EMBANKMENT FOR BRIDGE**

**Delete Section 02332 in its entirety. Refer to Section 02056: Embankment, Borrow, and Backfill**

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**SECTION 02455**

**DRIVEN PILES**

**Delete Section 02455 and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Materials, equipment and procedures for driving steel piles.

**1.2      RELATED SECTIONS**

- A.      Section 03055: Portland Cement Concrete
- B.      Section 03211: Reinforcing Steel and Welded Wire

**1.3      REFERENCES**

- A.      AASHTO M 31: Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- B.      AASHTO M 270: Structural Steel for Bridges
- C.      ASTM A 252: Welded and Seamless Steel Pipe Piles
- D.      ASTM D 4945: High Strain Dynamic Testing of Piles
- E.      AASHTO/AWS Welding Specifications

**1.4      SUBMITTALS**

- A.      Complete and submit the “Pile and Driving Equipment Data” form located at the end of this Section for each proposed hammer and pile/structure combination.
  - 1.      Provide all data in the form necessary to perform a pile driving wave equation analysis, together with preliminary schedule for driving.

2. Within 14 calendar days of submitting the form, the Engineer will provide either:
  - a. Approval to continue
  - b. Notification of inadequate equipment
- B. Include manufacturer's product data, specifications, and recommended installation instructions for the submitted pile hammer.

## **PART 2 PRODUCTS**

### **2.1 PIPE PILE SHELLS**

- A. Use new pipe pile shells having wall thickness as shown on plans.
- B. Meet requirements for ASTM A 252 steel, for either Grade 2 (normal strength) or Grade 3 (high strength) steel, or for other minimum yield stress value(s) shown on the plans.

### **2.2 STEEL HP SECTION PILES**

- A. Follow AASHTO M 270 for Grade 36 or 50 steel, as specified in the plans.

### **2.3 PORTLAND CEMENT CONCRETE**

- A. Class A(AE) Concrete following Section 03055.

### **2.4 REINFORCING STEEL**

- A. Meet AASHTO M 31, Grade 60.
- B. Follow requirements in Section 03211.

### **2.5 PILE DRIVER**

- A. Verify the equipment can drive piles to the required ultimate driving resistance without damage or without requiring an excessive number of blows to achieve the required tip elevation and capacity before mobilizing pile driver to the site, in accordance with this Section, article 1.4, paragraph A.
- B. Mobilize pile driver to the site only after the Engineer indicates that acceptable results of the wave equation analysis have been obtained in accordance with this Section, article 1.4, paragraph A.

- C. Remove any mobilized pile driver and related equipment found to be inadequate for the project pile driving conditions, and repeat the requirements of this Section, article 1.4, paragraph A until an acceptable pile driver system is obtained.
  - 1. Re-mobilize the accepted hammer at no cost to the Department.
- D. Provide accurate test information regarding the yield stress values (heat) for each batch of piles to be used on the project.
- E. Equip pile driver following Manufacturer's recommendations.
- F. Leads:
  - 1. Used with all types of hammers.
  - 2. Hold in the required position with guys, stiff braces, or both.
  - 3. Hold the pile parallel to the leads.
  - 4. Accommodate the maximum length of the pile segment, and extend to the lowest point that the hammer must reach.
  - 5. Obtain approval from the Engineer before using followers.
  - 6. Use fixed leads if necessary to maintain required driving tolerances described in this Section, article 3.3, paragraph C.
- G. Drive Cap (or Drive Head): Fits the top of pile and provides full bearing. For pipe piles, drive cap to have a machined surface to fully engage the end of the pipe.
- H. Hammer:
  - 1. With fully operable adjustable settings.
  - 2. Rated energy greater than or equal to the value indicated on the foundation plans.
  - 3. Inspect hammer cushion with the Engineer present before beginning pile driving and after every 100 hours of pile driving. Replace the cushion when it loses 25 percent or more of its original thickness.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Complete all foundation excavation before driving piles.
- B. Dewater excavation at least 1 ft below bottom of foundation at all times during pile foundation operations.

- C. Notify the Engineer of any conflicts between the designated position of piles and the locations of existing piles from previous construction, existing utilities, old foundations, or other potential conflicts. The Department designates new pile locations as required.

### **3.2 DYNAMIC ANALYSIS OF PILE DRIVING**

- A. Notify the Engineer at least five working days before pile driving is to begin on the project, and at least five working days before piles are to be driven on all subsequent abutment and bent foundations.
- B. The Department (or a Department authorized geotechnical firm) conducts at least one high-strain dynamic test (in accordance with ASTM D 4945) per foundation (abutment, bent, or pier foundation). The Department performs this test using pile driving analysis (PDA) equipment on the driving of the first pile at each abutment and bent/pier foundation.
- C. Cooperate with the Department in conducting PDA including, but not limited to, the following:
  - 1. Provide adequate space and conditions for the PDA rig and equipment.
  - 2. Climb the driver leads as necessary to attach, check and remove PDA gages; or provide a platform at least 4-foot square with a 4-foot high safety rail, equipped to be raised to the top of the pile located in the leads, to allow personnel to safely attach and remove gages.
  - 3. Begin installation of dynamic analysis gages after placing the pile in the leads. Allow approximately one hour per pile for installation of dynamic measuring equipment. Allow one additional hour for installation of measuring equipment after splicing, if splicing is performed and additional testing is required.
  - 4. Reduce the energy of the hammer or make other adjustments as necessary, if the stress exceeds the specified limit during the test.
  - 5. Drive the pile until the test indicates the required driving resistance shown on the plans is achieved, unless otherwise indicated by the Department.
- D. The Department evaluates the driving resistance, and establishes driving criteria, using a wave equation analysis program with signal matching.
  - 1. Do not drive other piles in the foundation until the Department gives notice that the test results indicate that sufficient capacity has been obtained, and the driving criteria for the remainder of the piles in the foundation has been established.



- E. If sufficient capacity is not obtained on initial drive testing, perform a restrike PDA test on the pile after a sufficient time period (generally 24 or more hours after the initial driving of the pile).
  - 1. Do not perform restrikes using a cold hammer.
- F. Notify the Engineer if any of the remaining piles in the foundation do not meet the established driving criteria before moving hammer away from bent/abutment area, or if driving conditions otherwise change.
  - 1. The Department may require testing additional piles and reestablishing driving criteria for the remaining piles within the foundation.

### **3.3 PILE INSTALLATION**

- A. Pre-drill/pre-auger if the designated pile tip elevation cannot be reached by the approved pile driver.
  - 1. Do not drill holes greater in diameter than the diameter or other maximum dimension of the pile.
- B. Pile Splicing:
  - 1. Use no more than one spliced section less than 6 ft, and splice no other section less than 30 ft for any pile.
  - 2. Inspect the driven pile section before splicing any pile section to determine if it has been distorted from its original shape, or otherwise damaged from pile driving operations.
    - a. Remove the damaged portion where distortion/damage has occurred, before splicing the next segment.
  - 3. Splice new pile segments parallel with previously driven pile segments.
  - 4. Butt weld the entire pile cross section using full penetration welds as per AWS D.1.1 for pipe piles and AASHTO/AWS D.1.5 for HP section piles.
- C. Keep driven piles within 6 inches of the designated plan location, and within 2 percent of vertical (plumb) throughout the total length of the pile (including bending). This is roughly equivalent to ¼ inch in a foot, or 0.60 inches in 30 inches.
  - 1. Verify that these criteria have been met, including using a calibrated pile bending probe where necessary, at the end of pile driving before proceeding with backfilling or other associated foundation work.
  - 2. Notify the Department to determine the appropriate resolution if either requirement is not met.
  - 3. Contractor bears all costs for any measures required to resolve the non-conformance including the price reduction factors shown in Table 1 in this Section, article 3.5.

- D. Drive additional piles as required to replace damaged piles and piles driven out of plumb, or plan location at locations designated by the Engineer.
- E. Drive down piles that were raised due to driving adjacent piles.
- F. Notify the Department of water collecting in open pipe piles so that they can be evaluated for possible damage.
  - 1. Drive additional piles as described above and abandon damaged piles as directed by the Department as necessary to resolve concerns with pile damage.
- G. Cover open-ended pipe piles to prevent the collection of precipitation, other sources of water, or debris.
- H. Cutting and Capping Piles:
  - 1. Remove all damaged material from the top of the piles.
  - 2. Keep sides of piles at least 9 inches away from nearest edge of pile cap.
  - 3. Cut off piles with clean, straight-line cuts to the designated elevation at a right angle to the pile axis.
  - 4. Level all irregularities before placing concrete for pile cap.
- I. Fill any annular space between the pipe shell and the surrounding soil with grout or clean sand washed down to reestablish lateral support.
- J. Remove all loose and displaced materials from around the completed piles leaving clean, solid surfaces to receive the concrete.
- K. Level all irregularities before constructing pile cap.

### **3.4 CONCRETE FILLING OF CLOSED-END PIPE PILES**

- A. Remove water and debris from pipe piles before filling with concrete.
- B. Receive approval from the Engineer before concrete placement in pipe piles.
- C. Fill pipe piles with specified concrete after compliance with all tolerances and required criteria have been confirmed by the Engineer.
- D. Avoid segregation of the concrete ingredients.
- E. Slump at the time of placement: between 4 and 6 inches.
- F. Arrange chutes, pipes, etc. used as aids in placing concrete so concrete does not separate (i.e. flows freely without having to be pushed or shoveled).

- G. Place concrete in pipe shell either by free fall, or through a tremie, drop chute, or concrete pump.
- H. Place concrete to the base without contacting either the rebar cage or the pipe wall.
- I. If a hopper or concrete bucket is used, discharge concrete into a funnel-type downpipe centered over the hopper or bucket.
  - 1. Do not discharge concrete directly from the mixer into the hopper or bucket.
- J. Use high frequency internal vibrators to consolidate concrete to at least 3 ft below the bottom of the rebar cage, or to at least 13 ft below the pile cutoff level, whichever is deeper.
- K. Do not vibrate concrete that has taken initial set.
- L. Vibrate concrete again after inserting cage to eliminate voids around the cage if rebar cage is inserted after concrete has been placed.
- M. Place the reinforcement cage into the driven pipe pile when the concrete reaches the planned bottom elevation of the reinforcement for piles larger than 16 inches in diameter.
  - 1. Support the reinforcement so it remains within 2 inches of the required vertical location.
  - 2. Support the cage from the top until the concrete reaches the top of the pile.
- N. Secure rebar cage in position until concrete is set.
- O. Provide lighting to the work site if concrete placement is to occur after daylight hours so all operations are plainly visible.
- P. Embed the tops of piles in the concrete pile cap as shown on the plans.

### **3.5 PRICE REDUCTIONS FOR NON-CONFORMING WORK**

- A. Price Adjustment - Reduction for Deficient Strength Concrete:
  - 1. Consider acceptance for concrete in pipe pile shells that are below the specified strength according to this Section.
  - 2. The Department will:
    - a. Use Contractor's unit bid price and the pay factors schedule presented in Section 03055 to calculate the price reduction for compensation.

- B. Price Adjustment - Reduction for Out-of-Tolerance Piles:
1. Demonstrate technical adequacy for piles driven out of plumb or plan location.
  2. The Department will:
    - a. Accept piles according to this Section, article 3.5.
    - b. Reject any pile driven outside the upper deviation limits shown in Table 1 below.
      - 1) No payment made for the rejected pile.
    - c. Use the Contractor's unit bid price and the pay factors schedule presented in Table 1 to calculate the price reduction for compensation.

### Table 1

PRICE REDUCTION PAY FACTORS FOR NON-CONFORMING PILE DRIVING TOLERANCES		
Pay Factor	Plumb, % (deviation from 2.0 %)	Plan Location, in. (deviation from 6 in.)
1.00	0.00 to 0.40	0.00 to 0.75
0.90	0.41 to 0.80	0.76 to 1.50
0.80	0.81 to 1.20	1.51 to 2.25
0.70	1.21 to 1.60	2.26 to 3.00
0.50	1.61 to 2.00	3.01 to 3.75
0.30	2.01 to 2.40	3.76 to 4.50
0.10	2.41 to 3.00	4.51 to 6.00
0.0, Reject	> 3.00	> 6.00

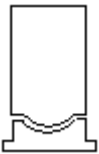
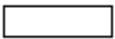
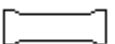

- C. The Department will:
1. Apply pay factors to each pile individually based on the total measured pile length from the specified cutoff elevation.
  2. Apply only the most critical of the two criteria (i.e. having the lowest pay factor) for any one pile.

END OF SECTION

The recommended “Pile and Driving Equipment Data” form follows.

**Pile and Driving Equipment Data**

Project No: \_\_\_\_\_  
 Project Name: \_\_\_\_\_ County: \_\_\_\_\_  
 Drawing No: \_\_\_\_\_  
 General Contractor: \_\_\_\_\_  
 Pile Driving Contractor/Subcontractor: \_\_\_\_\_  
 Phone: \_\_\_\_\_ FAX: \_\_\_\_\_  
 (Piles driven by, foreman): \_\_\_\_\_  
 Date Submitted: \_\_\_\_\_

<b>Hammer Components</b>		<b>Hammer</b>	Manufacturer: _____ Model: _____ Type: _____ Serial No: _____ Manufacturer's Maximum Rated Energy: _____ (k-ft) Stroke at Maximum Rated Energy: _____ (ft) Range in Operating Energy: _____ to _____ (ft-k) Range in Operating Stroke: _____ to _____ (ft) Modifications: _____																				
		<b>Ram</b>	Ram Weight: _____ (lbs) Ram Length: _____ (ft) (for diesel hammers)																				
		<b>Anvil</b>	Ram Cross Sectional Area: _____ (in <sup>2</sup> ) (With diesel hammers) Anvil Weight: _____ (lbs)																				
		<b>Hammer Cushion</b>	<table border="0"> <tr> <td></td> <td style="text-align: center;">Material #1</td> <td style="text-align: center;">Material #2</td> </tr> <tr> <td>Name:</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Area:</td> <td>_____</td> <td>_____ (in<sup>2</sup>)</td> </tr> <tr> <td>No. of Plates:</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Thickness:</td> <td>_____</td> <td>_____ (in)</td> </tr> <tr> <td>Mod. of Elasticity - E:</td> <td>_____</td> <td>_____ (psi)</td> </tr> <tr> <td>Coeff. of Restitution - e:</td> <td>_____</td> <td>_____</td> </tr> </table>		Material #1	Material #2	Name:	_____	_____	Area:	_____	_____ (in <sup>2</sup> )	No. of Plates:	_____	_____	Thickness:	_____	_____ (in)	Mod. of Elasticity - E:	_____	_____ (psi)	Coeff. of Restitution - e:	_____
	Material #1	Material #2																					
Name:	_____	_____																					
Area:	_____	_____ (in <sup>2</sup> )																					
No. of Plates:	_____	_____																					
Thickness:	_____	_____ (in)																					
Mod. of Elasticity - E:	_____	_____ (psi)																					
Coeff. of Restitution - e:	_____	_____																					
	<b>Drive Cap</b>	Helmet Weight: _____ (lbs) Bonnet Anvil Block Drive Head																					
<b>Pile</b>		<b>Pile Cushion</b> (Only for Concrete or Timber Piles)	Material: _____ Area: _____ (in <sup>2</sup> ) No. of Sheets: _____ Thickness/Sheet: _____ (in) Total Thickness of Pile Cushion: _____ (in) Mod. of Elasticity - E: _____ (psi) Coeff. of Restitution - e: _____																				
		<b>Pile</b>	Diameter: _____ (in) Wall Thickness: _____ (in) Taper (if any): _____ Length in Leads: _____ (ft) Ordered Length: _____ (ft) Required Driving Resistance: _____ (kips) Description of Splice: _____ Tip Treatment/Plate Description: _____																				

**Use Separate Data Sheet for Each Proposed Hammer and Pile/Structure Combination**

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**SECTION 02466**

**DRILLED SHAFTS**

**Delete Section 02466 and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Material, equipment, and procedures for constructing drilled shafts.

**1.2      RELATED SECTIONS**

- A.      Section 03055: Portland Cement Concrete.
- B.      Section 03211: Reinforcing Steel and Welded Wire.

**1.3      QUALITY ASSURANCE**

- A.      If shaft installation is unsatisfactory or the shaft cannot be completed within the required tolerances:
  - 1.      Immediately remove the reinforcing steel cage and the concrete.
  - 2.      Replace the reinforcing cage and place concrete in a satisfactory manner.
  - 3      Submit proposed remedial action for approval if the reinforcing steel and concrete cannot be removed.
  - 4.      Furnish materials and work necessary to correct out-of-tolerance drilled shaft construction at no cost to the Department.

**1.4      ACCEPTANCE**

- A.      Drilled shafts may be accepted at a reduced price when the concrete strength is below that specified.
  - 1.      Price adjustment pay factor following Section 03055.
  - 2.      The Department applies the pay factor to the measurement of the total length of any shaft containing concrete with strength tests falling below that specified.

## **1.5 SUBMITTALS**

- A. Submit procedure to Engineer to place concrete under water.

## **PART 2 PRODUCTS**

### **2.1 PORTLAND CEMENT CONCRETE**

- A. Class A(AE), unless otherwise specified. Refer to Section 03055.
- B. Modify as follows when placed under water:
  - 1. Use at least seven bags of cement per cubic yard.
  - 2. Provide equipment capable of pumping specified concrete.
  - 3. Use high range water reducers (super plasticizers) per Section 03055.
  - 4. Keep slump between 4 inches and 8 inches when tested at the truck.

### **2.2 REINFORCING STEEL**

- A. Refer to Section 03211.

### **2.3 DRILLING EQUIPMENT**

- A. Capable of:
  - 1. Drilling holes to the required diameter, location, alignment and depth in the type of materials present at the shaft locations.
  - 2. Installing and removing casing.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Drilling holes:
  - 1. Drill straight, vertical holes to the tip elevations shown on the plans or as determined by Engineer.
  - 2. Remove all loose material from the bottom of the drilled holes before placing concrete.
  - 3. Do not use water or slurry for drilling operations.

4. Do not begin drilling for a shaft located three diameters center-to-center or closer to an adjacent completed shaft until at least 48 hours after completion of placement of concrete for the completed shaft.
  5. Do not begin drilling for a shaft located between three and five diameters center-to-center from an adjacent completed shaft until at least 24 hours after completion of placement of concrete for the completed shaft.
  6. No concrete placement time restrictions for shafts five diameters center-to-center or greater apart.
- B. Casing:
1. Furnish and place casing when required to prevent the drilled hole from caving and any time groundwater is encountered. Remove casing as the concrete is placed.
  2. Keep the bottom of the casing between 2 ft and 5 ft below the top of the concrete surface when withdrawing.
  3. Prevent concrete separation when withdrawing the casing.

### **3.2 CONSTRUCTION TOLERANCES**

- A. Install the drilled shaft within 3 inches of the plan position in the horizontal plane at the plan elevation of the top of the shaft.
- B. Install the drilled shaft such that the vertical alignment of the shaft excavation does not vary from the plan alignment by more than 0.25 inches/foot of depth.
- C. Install the drilled shaft such that the top of the reinforcing steel cage is no more than 2 inches above or below the plan elevation.

### **3.3 PLACING REBAR CAGES**

- A. Rigidly brace the reinforcing cage with additional reinforcing steel as needed to retain its configuration during handling and construction. Loose bars will not be permitted. Pick cage in several locations as necessary to maintain cage shape and alignment during placement.

### **3.4 PLACING CONCRETE**

- A. Fill drilled holes within 24 hours after drilling.
- B. Prevent concrete from striking the steel-reinforcing cage during free-fall. Do not allow the free-fall of concrete to exceed 5 ft without the use of a tremie or a flexible metal spout.



- C. Do not vibrate concrete during initial placement. Remove all muck laitance and degraded concrete from the shaft.
- D. Vibrate the concrete during placement for at least the top 10 ft of the shaft.

### **3.5 PLACING CONCRETE UNDER WATER**

- A. Submit procedure to Engineer and secure Engineer's written approval to place concrete under water.
- B. Use concrete pumping equipment capable of pumping at least 50 yd<sup>3</sup>/hr against a minimum 20 ft head of concrete measured from the discharge end of the pump hose extension (tremie pipe).
- C. Use a rigid, steel pipe pump hose extension for the tremie pipe with tight couplings straight to within ½ inch in 10 ft.
  - 1. Length of extension must be greater than or equal to the depth of the shaft.
  - 2. Inside diameter must be greater than or equal to the concrete pump discharge hose, but not more than one-half of the inside diameter of the reinforcing cage.
- D. Purge the tremie pipe of water.
  - 1. Insert a sturdy plastic ball or equivalent into the top of the pump hose extension before connecting the hose from the concrete pump.
  - 2. The ball must fit snugly into the pump hose extension when the hose is filled. The hose must be strong enough to resist rupture.
  - 3. Prime the hose and pipe with Portland Cement slurry.
- E. Lower a small diameter pole with an attached flat plate into the hole to determine the top surface of concrete.
  - 1. Both pole and pipe should be marked so that the length of penetration can be determined immediately.
  - 2. Prevent the end of the pipe from becoming plugged with soil from the bottom of the hole.
- F. Begin pumping the concrete immediately after setting the reinforcing cage and pipe in the hole. Do not begin raising the pipe until the concrete surface is 10 ft above the bottom of the pipe.
- G. Keep the bottom of the tremie pipe at least 5 ft below the top of the concrete until the placement is complete and all muck, laitance, and all unsuitable concrete is removed. Provide a positive hold down if the pipe floats to ensure that the minimum 5 ft penetration is maintained.

### **3.6 FIELD QUALITY CONTROL**

- A. If plugging of the pipe, equipment breakdown, or loss of the seal at the end of the pipe occurs:
  - 1. Pull the pipe, reset it 2 ft below the top of the concrete, and purge it.
  - 2. Lower the pipe to at least 5 ft below the top of the placement, and continue pumping concrete until all degraded concrete has lifted to the top of the shaft.
  - 3. Remove all muck, laitance and degraded concrete.

END OF SECTION

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**SECTION 02721**

**UNTREATED BASE COURSE (UTBC)**

**Delete Section 02721 and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Production, construction, and compaction of UTBC used for pavements, shoulders, and incidental construction.

**1.2      RELATED SECTIONS**

- A.      Section 01572: Dust Control and Watering

**1.3      REFERENCES**

- A.      AASHTO T 11: Materials Finer than 75- $\mu$ m (No. 200) Sieve in Mineral Aggregates by Washing
- B.      AASHTO T 19: Bulk Density ("Unit Weight") and Voids in Aggregate
- C.      AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates
- D.      AASHTO T 89: Determining the Liquid Limit of Soils
- E.      AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils
- F.      AASHTO T 96: Resistance to Degradation of Small-Sized Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- G.      AASHTO T 180: Moisture-Density Relations of Soils Using a 4.54 kg (10 lb) Rammer and 457 mm (18 in) Drop
- H.      AASHTO T 193: The California Bearing Ratio
- I.      AASHTO T 255: Total Evaporable Moisture Content of Aggregate by Drying

- J. AASHTO TP 61: Determining the Percent of Fracture in Coarse Aggregate
- K. UDOT Minimum Sampling and Testing Requirements

#### **1.4 SUBMITTALS**

- A. Submit a written report for approval for each aggregate class and source, a minimum of five working days prior to placement. Include the following:
  - 1. Aggregate suitability. Refer to this Section, Part 2, Products.
  - 2. Name of supplier and location of source.
  - 3. Maximum Dry Density and Optimum Moisture Content. Refer to AASHTO T 180, Method D.
  - 4. Job mix gradation including single values for each sieve size, No. 4 and finer, within the gradation limits of Table 2.

#### **1.5 ACCEPTANCE**

- A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.
- B. Type I Placement – Pavement Section (Includes placement for Curb or Curb and Gutter when in conjunction with placement for pavement section.)
  - 1. Use Class A aggregate, Table 1.
  - 2. The Engineer takes random samples from the grade and tests for moisture, gradation, and laboratory density, and performs In-place Density determinations.
  - 3. Meet gradation limits and applicable tolerances of Table 2 for each gradation test. Each subplot will be evaluated separately and not averaged with other sublots.
  - 4. Meet minimum density test average of 97 percent of maximum laboratory density with no test less than 94 percent.
- C. Type II Placement – Incidental (Includes placement for Curb, Curb & Gutter, Driveways, Pedestrian Access Ramps, Sidewalk, Waterways, Flatwork, and other items of work in the contract to which UTBC is included and not measured or paid for separately.)
  - 1. Use Class A or B aggregate, Table 1.
  - 2. The Engineer takes random samples from the grade and tests for moisture, gradation, and laboratory density, and performs In-place Density determinations.
  - 3. Meet gradation limits and applicable tolerances of Table 2 for each gradation test. Each subplot will be evaluated separately and not averaged with other sublots.

- 4. Meet minimum density test average of 95 percent of maximum laboratory density with no test less than 92 percent.
- D. Type III Placement – Shoulder
  - 1. Use Class A, B or C aggregate, Table 1.
  - 2. Adjust moisture content prior to compaction.
- E. Material not meeting the gradation requirements may be allowed to remain in-place at the discretion of the Engineer, provided density requirements are met. However, additional lots may not be placed until the deficiencies are addressed and corrected.
- F. When directed by the Engineer, correct material that does not meet the specified criteria by scarifying, placing additional material, re-mixing, reshaping and re-compacting. Rework unacceptable material at no additional cost to the Department.
- G. Do not place additional material on any unaccepted layer.
- H. When directed by the Engineer, remove products found defective after placement and replace with acceptable products at no additional cost to the Department

## **PART 2 PRODUCTS**

### **2.1 AGGREGATES**

- A. Well-graded, clean, hard, tough, durable and sound mineral aggregates consisting of crushed stone, crushed gravel or crushed slag; free of organic matter and contamination from chemical or petroleum products; meeting the requirements of Table 1.

**Table 1**

<b>Aggregate Properties</b>				
	<b>Aggregate Class</b>			
	<b>A</b>	<b>B</b>	<b>C</b>	
Dry Rodded Unit Weight	Not less than 75 lb/ft <sup>3</sup>			AASHTO T 19
Liquid Limit/ Plastic Index	Non-plastic		PI ≤ 6	AASHTO T 89 AASHTO 90
Aggregate Wear	Not to exceed 50 percent.			AASHTO T 96
Gradation	Table 3			AASHTO T 11 AASHTO T 27
CBR with a 10 lb surcharge measured at 0.20 inch penetration	70% Minimum		N/A	AASHTO T 193
Two Fractured Faces	50 % Min	N/A	N/A	AASHTO TP 61

- B. Establish the job mix (target) gradation for the ¾ inch sieve and finer within the gradation limits. The Job Mix Gradation Tolerance is the allowable deviation from the job mix (target) gradation on the applicable sieves. All other percents passing will be within the gradation limits. Refer to AASHTO T 11 and AASHTO T 27.

**Table 2**

<b>Gradation Limits</b>		
<b>Sieve Size</b>	<b>Job Mix Gradation Target Band</b>	<b>Job Mix Gradation Tolerance</b>
1-1/2 inch	100	
1 inch	90 - 100	
3/4 inch	70 - 85	±9.0
1/2 inch	65 - 80	±9.0
3/8 inch	55 - 75	±9.0
No. 4	40 - 65	±7.0
No. 16	25 - 40	±5.0
No. 200	7 - 11	±3.0

Percent passing based on total aggregate (dry weight), and fine and coarse aggregate having approximately the same bulk specific gravities.

## **PART 3      EXECUTION**

### **3.1      INSTALLATION**

- A.    Mixing: Provide moisture content of  $\pm 2$  percent of optimum at the time of placement. Refer to AASHTO T 180, Method D and AASHTO T 255.
- B.    Procedures for changing the Job-Mix Gradation
  - 1.    Submit changes in writing 24 hours prior to placement for approval by the Engineer.
- C.    Placing: Place in layers of uniform thickness and compact each layer to a thickness not to exceed a 6 inch depth. Do not place on any frozen surface. Refer to Section 01572.
- D.    Finishing: Uniform line and grade with surface deviations no more than  $\frac{3}{8}$  inch in 10 ft in any direction.
  - 1.    Profile Tolerance — Correct any profile deviations greater than  $\frac{3}{8}$  inch.
    - a.    Rework minimum of 4-inch lift to achieve homogeneous density.
    - b.    Determine limits of correction based on extent of deviation.
    - c.    Continue finishing until existing deviation is less than  $\frac{3}{8}$  inch.
- E.    Compaction: Maintain optimum moisture content  $\pm 2$  percent.
  - 1.    Use appropriate compaction equipment adjacent to abutments, backwalls, approach slabs, wing walls, retaining walls, and other structures.
  - 2.    Use a minimum of 2 passes with a roller for Type III placement or as directed by the Engineer.

END OF SECTION

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**SECTION 02746**

**HYDRATED LIME**

**Delete Section 02746 and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Products and procedures for incorporating hydrated lime into all asphalt mixes.

**1.2      REFERENCES**

- A.      AASHTO M 303: Lime for Asphalt Mixtures
- B.      ASTM C 110: Physical Testing of Quicklime, Hydrated Lime, and Limestone
- C.      ASTM C 1097: Hydrated Lime for Use in Asphaltic-Concrete Mixtures
- D.      ASTM C 1602: Mixing Water Used in the production of Hydraulic Cement Concrete
- E.      UDOT Quality Management Plan

**1.3      QUALITY ASSURANCE**

- A.      Prequalification: Hydrated Lime, through UDOT Quality Management Plan for Hydrated Lime, Section 510.

**1.4      SUBMITTALS**

- A.      Verification that the supplier is pre-qualified.



## **PART 2      PRODUCTS**

### **2.1      HYDRATED LIME**

- A.    Hydrated Lime: Meet AASHTO M 303, Type I, as specified.
  - 1.    Conform physical requirements to ASTM C 1097, subparagraph d.1.
  - 2.    Use test method ASTM C 110, paragraph 5.4.

### **2.2      WATER**

- A.    Use potable water or water meeting ASTM C 1602.

## **PART 3      EXECUTION**

### **3.1      APPLICATION**

- A.    Add hydrated lime to all asphalt pavement mixes.
  - 1.    Add the determined quantity of lime, following mix design.
  - 2.    Base the amount of hydrated lime used on the dry weight of the aggregate.
  - 3.    Use either Method A or B, unless Method B is called for in the bid schedule.
- B.    Method A: Lime Slurry: One part lime and three parts water by weight.
  - 1.    Add lime at a minimum of 1 percent by weight.
  - 2.    Maintain the lime slurry mix in a malted milk consistency.
  - 3.    Deliver lime slurry to the twin shaft pugmill for mixing with aggregate.
  - 4.    Adjust quantity (percent) of lime as necessary, based on results of Hamburg Wheel Tracker test.
- C.    Method B: Lime and Aggregate Stockpile Marination:
  - 1.    Before introducing hydrated lime, provide sufficient free moisture to thoroughly wet the aggregate and activate the lime.
  - 2.    Add lime at a minimum of 1 ½ percent by weight.
  - 3.    Thoroughly mix wet aggregate/lime mixture in a twin shaft pugmill.
  - 4.    Marinate the aggregate/lime mixture in the stockpile for a minimum of 48 hours.
  - 5.    Adjust quantity (percent) of lime as necessary, based on results of Hamburg Wheel Tracker test.
  - 6.    Use the wet cured aggregate within 60 days.

- D. Mixing Methods A and B: Provide a horizontal twin shaft pugmill.
  - 1. Adjust mixing paddles in the pugmill so that the aggregate being discharged is completely coated by the lime slurry.
  - 2. Do not allow volume of material in the pugmill to extend above the vertical position of the blade tips.

### **3.2 CONTROLLING AND MONITORING**

- A. Control the lime batching operation by the Program Logic Control (PLC) System based upon production set up data.
- B. Monitor the following aspects and record on the computer data log printout:
  - 1. Display target and actual rates.
  - 2. Belt weight bridge for lime.
  - 3. Locked-in water meter.
  - 4. Meter to transfer lime slurry.
  - 5. Closed end loop to mainframe computer.

### **3.3 QUALITY CONTROL**

- A. Tolerance Controls
  - 1. Tolerance lime weight vessel static calibration  $\pm 1.5$  percent.
  - 2. Dynamic delivery calibration  $\pm 1.5$  percent.
  - 3. Inlet flow meter  $\pm 2$  percent.
  - 4. Discharge flow meter  $\pm 1.5$  percent.

END OF SECTION

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**SECTION 02749**

**ASPHALT DRIVEWAY**

**Delete Section 02749 in its entirety.**

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**SECTION 02754**

**DOWEL BAR RETROFIT**

**Delete Section 02754 in its entirety and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Procedures and materials for installing coated dowel bars across existing transverse joints and cracks.

**1.2      RELATED SECTIONS**

- A.      Section 03211: Reinforcing Steel and Welded Wire

**1.3      REFERENCES**

- A.      AASHTO M 148: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- B.      AASHTO T 22: Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens
- C.      ASTM C 882: Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear

**1.4      SUBMITTALS**

- A.      Provide the Engineer with documentation from the manufacturer verifying that the patching material meets the requirements of this Section, article 2.1 paragraph F.

## **PART 2      PRODUCTS**

### **2.1      MATERIALS**

- A.     Dowel Bars: 1½ inch x 18 inch, smooth steel rod, following Section 03211.
- B.     Bond Breaking Compound: Use a bond-breaking compound approved by the Engineer.
- C.     Chair Devices: Coat according to Section 03211, or make of non-metallic materials, the devices used to support and hold the dowel bar in place.
  - 1.       Provide a minimum clearance of ½ inch between the bottom of the bar and the surface upon which the chair is placed.
- D.     End Caps:
  - 1.       Place on dowels, tight fitting end caps made of non-metallic materials that allows for ¼ -inch movement of the bar at each end.
  - 2.       Submit a sample of the end caps to the Engineer for approval prior to use on the project.
- E.     Caulking Filler: Submit a sample of the caulking filler to the Engineer for approval prior to use on the project.
- F.     Patching Material:
  - 1.       Use mix with ¼ inch nominal maximum aggregate size.
  - 2.       Select a material that meets the following performance criteria:
    - a.       Material must achieve a minimum compressive strength of 4000 psi at 28 days. AASHTO T 22.
    - b.       Material must achieve a minimum bond strength of 1000 psi at 24 hours. ASTM C 882.
- G.     Joint/Crack Preservation Material: Use a rigid removable material capable of maintaining the joint or crack.

### **2.2      EQUIPMENT**

- A.     Jackhammers: To prevent spalling, use jackhammer less than the nominal 30 lb class.

## **PART 3      EXECUTION**

### **3.1      CONSTRUCTION**

- A.     Saw cut the pavement as required per PV Series Standard Drawings.
- B.     Jackhammer and sand blast to clean all exposed surfaces and cracks, removing slurry and loose concrete.
- C.     Clean up and properly dispose of all residues from the saw, jackhammer and sand blasting process.
- D.     Place caulking filler in existing joint or crack to prevent intrusion of patching material. See PV Series Standard Drawings.
- E.     Pre-coat the dowel bars with a bond-breaking compound.
- F.     Place the foam core board on the dowel bar in line with the transverse joint or crack.
- G.     Fit the foam core board tightly around the dowel bar and to the bottom and edges of the slot.
- H.     Maintain the foam core board in a vertical position and tight to all edges during placement of the patching material as per PV Series Standard Drawings.
- I.     Place bars so that the bars do not extend more than 11 inches past the centerline of the slot.
- J.     Provide a minimum space of ½ inch in all directions around bar.
- K.     Repair or replace any dowel bars damaged at no cost to the Department.
- L.     Dampen thoroughly all surfaces of the slot immediately prior to filling with patching material.
  - 1.       Prevent standing water in the slot.
  - 2.       Remove all excess water with compressed air.
- M.     Fill the slot with an approved patching material.
  - 1.       Consolidate the material in the slot and around the dowel bar with an appropriate size vibrator.
  - 2.       Finish patching materials to existing surfaces.

3. Place and cure the patching material according to manufacturer's specifications.
  4. Require a representative from the manufacturer of the patching material to be on-site for the first day's placement.
  5. Cure using ASHTO M 148, Type 1-D, Class A.
- N. Replace any individual dowel bar retrofit not functioning or damaged at no cost to the Department.
- O. Remove joint preservation material as needed and repair per to a depth of 2 inches and reseal.
- P. Obtain cores through the slot and dowel system to verify placement of the dowel bar and consolidation of the material around the dowel bar.
1. Obtain three cores from random locations from each of the first three production days.
  2. Use cores from subsequent production days at the discretion of the Engineer.

END OF SECTION

**Supplemental Specification  
2005 Standard Specification Book  
SECTION 02785**

**CHIP SEAL COAT**

**Delete Section 02785 in its entirety and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Materials and procedures for applying emulsified asphalt, followed with an application of cover material and bituminous flush coat.
- B.      Cover materials.

**1.2      RELATED SECTIONS**

- A.      Section 01554: Traffic Control
- B.      Section 01558: Temporary Pavement Markings
- C.      Section 02742S: Project Specific Surfacing Requirements
- D.      Section 02745: Asphalt Material
- E.      Section 02748: Prime Coat/Tack Coat

**1.3      REFERENCES**

- A.      AASHTO T 11: Materials Finer Than 75  $\mu\text{m}$  (No. 200) Sieve in Mineral Aggregates by Washing
- B.      AASHTO T 19: Unit Weight and Voids in Aggregate
- C.      AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates
- D.      AASHTO T 59: Standard Test Methods for Emulsified Asphalts
- E.      AASHTO T 96: Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine



- F. AASHTO T 104: Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
- G. AASHTO T 278: Surface Frictional Properties Using the British Pendulum Tester
- H. AASHTO T 279: Accelerated Polishing of Aggregates Using the British Wheel
- I. AASHTO TP 61: Determining the Percentage of Fractured Particles in Coarse Aggregate
- J. UDOT Materials Manual of Instruction
- K. UDOT Minimum Sampling and Testing Requirements
- L. UDOT Quality Management Plan

#### **1.4 SUBMITTALS**

- A. Mineral Aggregate
  - 1. Test Reports
    - a. Cover Material meets requirements of this Section, article 2.4.
- B. Verification that asphalt/polymer emulsion meets Section 02745
- C. Verification that asphalt/polymer supplier adheres to UDOT Quality Management Plan for Asphalt Emulsion 508.
- D. Submit all documentation verifying asphalt application rates, chip application, and other calibration verification for applied materials during the chip seal operations to the Engineer on a daily basis, or as requested by the Engineer.
- E. Provide vendor's bill of lading certifying the material was diluted in accordance with this Section, article 2.3.

#### **1.5 ACCEPTANCE**

- A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.
- B. Price Adjustments – Cover Material Gradation
  - 1. Based on the number of samples per lot and the minimum pay factor.
  - 2. Pay Factors for aggregate gradation when tested in accordance with AASHTO T 27 and AASHTO T 11 are indicated in Table 1.

**Table 1**

<b>Aggregate Gradation Pay Factors</b>			
<b>Sieve Size</b>	<b>Pay Factor*</b>	<b>Type I Acceptance Band**</b>	<b>Type II Acceptance Band**</b>
1/2 inch	1.00 0.95 0.90 0.85 Reject		100.0 99.0 98.0 97.0 < 97.0
3/8 inch	1.00 0.95 0.90 0.85 Reject	100.0 99.0 98.0 97.0 < 97.0	70.0 - 90.0 69.5 - 91.5 69.2 - 92.0 68.0 - 92.0 < 68.0 and > 92.0
No. 4	1.00 0.95 0.90 0.85 Reject	0 - 15 15.1 - 16.0 16.1 - 17.0 17.1 - 18.0 > 18.0	0 - 10.0 10.1 - 10.5 10.6 - 11.0 11.1 - 12.0 > 12.0
No. 8	1.00 0.95 0.90 0.85 Reject		0.0 - 5.0 5.1 - 5.5 5.6 - 6.0 6.1 - 7.0 > 7.0
No. 200	1.00 0.75 0.50 Reject	0.0 - 1.0 1.1 - 1.5 1.6 - 2.0 > 2.0	0.0 - 1.0 1.1 - 1.5 1.6 - 2.0 > 2.0

\* Use the lowest individual pay factor for combined gradation

\*\* Average of tests

## **PART 2      PRODUCTS**

### **2.1      CATIONIC EMULSIONS**

- A.      CRS-2A per Section 02745.
- B.      CRS-2P per Section 02745.
- C.      LMCRS-2 per Section 02745.

## 2.2 HIGH FLOAT EMULSIONS

- A. HFRS-2P per Section 02745.
- B. HFMS-2 per Section 02745.
- C. HFMS-2P per Section 02745.

## 2.3 FLUSH COAT

- A. Use the emulsion as designated in Special Provision 02742S, diluted two parts concentrate to one part water by the Manufacturer.

## 2.4 COVER MATERIAL

- A. Use crusher processed virgin aggregate consisting of natural stone, gravel, or slag meeting the requirements of Table 2.

**Table 2**

<b>Chip Seal Cover Material Properties</b>		
Unit Weight, see Note 1	AASHTO T 19	100 lb/ft <sup>3</sup> , max
One Fractured Face	AASHTO TP 61	95% min.
Two Fractured Faces	AASHTO TP 61	90% min.
LA wear, see Note 1	AASHTO T 96	30% max.
Soundness	AASHTO T 104	10% max.
Flakiness Index	Material MOI 8-933	17 max.
Stripping, see Note 1	Materials MOI 8-945	10% max.
Polishing, see Note 1 (Performed on aggregate prior to crushing)	AASHTO T 278, T 279	31 min.
Field Coating of Emulsified Asphalt (using project specified emulsion)	AASHTO T 59	Rating of "Good"
Note 1: The Department has the right to waive this requirement if the aggregates have proven acceptable through successful past performance as determined by the Engineer.		

- B. Grade with the following limits to meet the specified test standard in AASHTO T 27 and T 11.

**Table 3**

<b>Gradation Limits</b>		
<b>Sieve Size</b>	<b>Percent Passing</b>	
	<b>Type I</b>	<b>Type II</b>
1/2 in		100
3/8 in		70-90
No. 4	100	0-10
No. 8	0 -15	0-5
No. 200	0 - 1	0-1

## **2.5 BLOTTER MATERIAL**

- A. Refer to Section 02748.

## **2.6 TEMPORARY PAVEMENT MARKERS**

- A. Refer to Section 01558.

## **2.7 EQUIPMENT**

- A. Use distributor trucks meeting the following requirements:
1. Tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of the tank contents.
  2. Insulated tanks capable of storing the binder at temperatures which allow the binder to remain consistent with the appropriate viscosity for proper application rates.
    - a. Use tanks equipped with baffles to prevent pressure surges resulting from the asphalt sloshing in the tank when starting and stopping.
    - b. Use trucks equipped with devices to provide for accurate and rapid correlation and control of the amount of bituminous material being applied, with that of the truck or distributor gauges.
  3. Constant volume circulation pumps and heaters to maintain a pressurized system so binder will be uniformly heated.
    - a. Circulation pump must spray a constant volume for the entire length of the spray bar for each application.
  4. Spray bar and nozzles designed to provide an appropriate fan width to provide uniform transverse distribution, without corrugation or streaking.
    - a. Adjust the spray bar height to provide uniform distribution of binder across the application width and triple lapping of the binder on the pavement surface.
    - b. Use a fully circulating spray bar with a positive shutoff valve.

5. Computerized rate control system allowing the operator to control all distributor operations from the cab to include:
  - a. Regulation of the pressure of the material application and automatic adjustment of rate control to the unit ground speed.
    - 1) Hydrostatic system capable of maintaining a tolerance of  $\pm 0.3 \text{ gal/yd}^2$ .
  - b. Adjustment of the spray bar height and width and shut off of individual spray bar sections.
- B. Use a self-propelled aggregate (chip) spreader specifically designed and manufactured for chip seal operations, equipped with the following:
  1. Computerized controls which will apply a uniform, even layer of aggregate across the full width of the binder, and adjust output to the unit ground speed.
    - a. Use gates adjustable to drop the correct amount of aggregate, plus or minus  $1 \text{ lb/yd}^2$ .
  2. Variable width spreader with hydraulic control extension and adjustable discharge gates
  3. Spreading hopper with a minimum capacity to cover a full lane of travel, plus  $1 \text{ ft/pass}$ .
  4. Spinner broadcast type of aggregate spreader not allowed.
- C. Use sufficient number of dump trucks to circumvent any interruption in the supply of chips to the spreader.
  1. Use tandem axle dump trucks or larger, or conveyor discharge trucks, to minimize the number of hook-ups.
  2. Use dump trucks with matching hitches and compatible with the aggregate spreader to provide smooth hook-ups and to minimize any spillage when loading the hopper
  3. Use trucks in good mechanical condition and that do not leak.
    - a. Use truck tires that do not pick up binder or aggregate when driving on the new surface.
- D. Use a minimum of three articulating type pneumatic rollers for rolling operations.
  1. Use rollers weighing between 8 tons minimum and 12 tons maximum with a minimum width of 6 ft.
  2. Use rollers with pneumatic tires of equal size diameter and having treads satisfactory to the Engineer.
  3. Inflate tires so that the entire roller width area is compacted by either the rear-axle tires or the front-axle tires.
    - a. Inflate tires to  $90 \text{ lb/in}^2$ , or lower as approved by the Engineer.
      - 1) Maintain tire pressure within  $5 \text{ lb/in}^2$ .

- E. Sweeping equipment
  - 1. Use rotary brooms with nylon or steel bristles or, pickup or vacuum brooms for pavement cleaning or brooming operations.
    - a. Keep downward pressure to a minimum
    - b. Use water as requested by the Engineer if excessive dust is generated during sweeping operations.
    - c. Use pickup or vacuum sweepers in urban areas where aggregate accumulates in gutters or where removal is required from the edge of the shoulder.
    - d. Do not dislodge embedded aggregate when brooming chip sealed roadway.
- F. Blotter Material Equipment
  - 1. Apply blotter material by means of a truck mounted spinner broadcast spreader or other equipment as approved by the Engineer.
- G. All equipment is subject to inspection and approval by the Engineer.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Clean the road surface of all dirt, sand, dust, and other objectionable material to the satisfaction of the Engineer.
- B. Protect all structures, including guardrail, guideposts, concrete barriers, parapet walls, etc.
- C. Cover manholes, valve boxes, drop inlets and other service utility entrances before placing any chip seal coat.
- D. Stockpile blotter material, a minimum of 0.25 lb/yd<sup>2</sup> meeting the requirements of Section 02748 at a site within twenty minutes delivery time of each road section being chip sealed, and have on site application equipment before beginning chip seal work.
  - 1. Upon Engineer approval, stockpiling of blotter material may be waived if blotter material can be obtained and ready to spread within twenty minutes of a road section being chip sealed.
  - 2. Equipment to spread blotter material is subject to inspection and approval by the Engineer.

### **3.2 LIMITATIONS**

- A. Complete all work between May 15 and August 31.
- B. Do not place chip seal coat if surface moisture is present.
- C. Place seal coat when:
  - 1. Pavement temperature is between 70 and 136 degrees F.
  - 2. Air temperature is between 50 and 110 degrees F.
  - 3. Forecasted temperature is not expected to be below 40 degrees F within 3 days after placement.
- D. Do not apply any bituminous asphalt after 6:00 p.m. if temperatures in this Section, article 3.2 paragraph C can not be maintained throughout all night time hours.
- E. On interstate routes, do not open to traffic the same day chip seal coat is placed.
  - 1. Sweep and open to traffic no earlier than 14 hours after placing cover material.
- F. Apply bituminous flush coat material after receiving approval from the Engineer, but no earlier than 48 hours after application of the cover material.
  - 1. Apply bituminous flush coat material when the air temperature in the shade is 50 degrees F and rising, and the pavement temperature is 70 degrees F and rising.
  - 2. Do not apply bituminous flush coat material during fog, rain, or other adverse conditions.

### **3.3 COVER MATERIAL STOCKPILE**

- A. Construct on a clean base to minimize contamination.
- B. Construct to facilitate uniform dampening. Avoid excess moisture.

### **3.4 TEMPORARY PAVEMENT MARKER APPLICATION**

- A. Refer to Section 01558.

### 3.5 ASPHALT MATERIAL /COVER MATERIAL APPLICATION

- A. Apply asphalt material at a rate sufficient to obtain 50 percent chip embedment before the rolling operation, and 70 percent chip embedment after rolling operation.
  - 1. Adjust application rates throughout the project depending on existing conditions.
- B. Apply the asphalt emulsion at a minimum temperature of 145 degrees F.
- C. Do not apply asphalt material if any of the following conditions apply:
  - 1. Material does not meet the required viscosity.
  - 2. Material does not spray through the distributor in a uniform way and remain in place on the roadway.
- D. Place building paper adjacent to the transverse construction joint before starting each spraying operation.
  - 1. Maintain the control valve to act instantaneously, both at start-up and cut-off.
- E. Locate longitudinal joints within 6 inches of the traffic lane line location.
  - 1. Construct meet lines with no skip or voids between adjacent passes.
  - 2. Do not place a double thickness of cover material.
- F. Calibrate the spreader at the beginning of each day and as often as necessary to comply with Table 4.
  - 1. Maintain a distance of less than 150 ft between the distributor and the chip spreader.
  - 2. Maintain the chip spreader speed such that chips do not bounce or roll upon application.

**Table 4**

<b>Approximate Spread Rates</b>	
<b>Unit Weight lbs/ft<sup>3</sup></b>	<b>Application Rate lbs/yd<sup>2</sup></b>
60 - 65	17.0
65 - 70	18.4
70 - 75	19.8
75 - 80	20.7
80 - 85	22.1
85 - 90	23.5
90 - 95	24.9
95 - 100	25.8



### **3.6 SURFACE ROLLING**

- A. Use a minimum of three pneumatic-tire rollers in a longitudinal direction to roll surface after the cover material has been spread.
- B. Roll a minimum of three passes to seat the cover material.
  - 1. A pass is defined as traveling in one direction only.
- C. Control bleeding with blotter material and as directed by the Engineer.
- D. Set the roller speed to prevent bouncing or skidding, not to exceed 5 mph.
  - 1. Reduce roller speeds during directional changes to prevent tearing of the surface.
  - 2. Repair all damage done to the seal coat by the rollers.
- E. Synchronize the speed of the distributor and chip spreader with that of the rolling operation.
  - 1. Begin initial rolling, consisting of one complete coverage, immediately behind the chip spreader.
  - 2. Begin secondary rolling, consisting of second and third coverage, immediately after completing initial rolling.
  - 3. Synchronize all operations to keep rolling operations within 2500 feet of the ongoing chip seal application.
- F. Sweep excess cover material off the roadway after the emulsion has set.
  - 1. Remove excess cover material to the satisfaction of the Engineer before opening the roadway to traffic.

### **3.7 BITUMINOUS FLUSH COAT APPLICATION**

- A. Clean the surface of all dirt, sand, dust, loose chips, and other objectionable material to the satisfaction of the Engineer before applying bituminous flush coat.
- B. Apply the bituminous flush coat at a rate of  $0.11, \pm 0.01$  gal/yd<sup>2</sup>.
  - 1. Keep traffic off the flushed surface until the bituminous material has set sufficiently to prevent tracking or pick-up.
  - 2. Allow a minimum of 24 hours before applying permanent application of traffic striping or markings after completing flush seal.

### **3.8 TRAFFIC CONTROL**

- A. Refer to Section 01554.

END OF SECTION

**Supplemental Specification  
2005 Standard Specification Book**

**SECTION 02891**

**TRAFFIC SIGNS**

**Delete Section 02891 in its entirety and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Materials and procedures for installing traffic signs.

**1.2      RELATED SECTIONS**

- A.      Section 02317: Structural Excavation
- B.      Section 03055: Portland Cement Concrete
- C.      Section 03211: Reinforcing Steel and Welded Wire
- D.      Section 05120: Structural Steel
- E.      Section 06055: Timber and Timber Treatment

**1.3      REFERENCES**

- A.      ASTM A 153: Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- B.      ASTM A 314: Stainless Steel Billets and Bars for Forging
- C.      ASTM A 500: Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- D.      ASTM A 513: Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing
- E.      ASTM A 653: Steel, Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process

- F. ASTM A 1011: Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
- G. ASTM B 209: Aluminum and Aluminum-Alloy Sheet and Plate
- H. American Plywood Association (APA) Product Standard
- I. Code of Federal Regulations (CFR)

#### **1.4 TRAFFIC SIGN COMPONENTS**

- A. Substrate: The base material, usually plywood or aluminum, upon which the background sheeting is attached.
- B. Sheeting: The reflective or non-reflective material that comprises the background legend, border, and symbols.
- C. Sheeting Components: The matched component products required for the manufacture of highway signs will consist of the sheeting, cutout letters and borders, adhesives, inks and overlay films. Failure of the sheeting inks or overlay films, provided, sold, or recommended for use, will constitute a failure of the entire sign and be replaced under manufacturer's warranty replacement obligations. All components and warranties will be compatible with substrates used by UDOT, including 90/90 HDO plywood and Aluminum ASTM B 209 5052 - H 38 or 6061-T6.
- D. Panel: Assembly of substrate and attached sheeting. Several panels may be necessary to complete one sign. Panel types are:
  - 1. Type
    - a. A: Reflective sheeting on sheet aluminum.
    - b. P: Reflective sheeting on plywood.
  - 2. Legend:
    - a. 1: With non-reflective legend, symbols, and borders.
    - b. 2: With reflective legend, symbols, and borders.
- E. Sign: A complete assembly comprised of post, frame, and panel.
- F. Auxiliary Sign: A sign including frame, if required, attached and supplemental to a complete sign assembly.
- G. Panel replacement: Removing the existing panel and attaching a new panel to the frame.
- H. Panel Overlay: Attaching new panels to all or part of an existing panel.

- I. Size: Horizontal x vertical

## **1.5 SIGN CODES**

- A. New Sign: N
- B. Auxiliary Sign: Aux
- C. Relocation: R
- D. Removal: X
- E. Panel Replacement: PR
- F. Panel Overlay: PO

## **1.6 SUBMITTALS**

- A. Submit three sets of drawings for overhead structures for prefabrication approval. Allow 14 calendar days for approval.
- B. Manufacturer's Product Data and Specifications.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. Fabricate signs and posts as specified per SN Series Standard Drawings.
- B. Substrate: 0.080 inch thick. ASTM B 209 alloy 6061-T6, or 5052-H38.
- C. Plywood as specified below and which meets the APA product standard 1 PSI-83, Group 1,  $\frac{5}{8}$  inch thick.
  - 1. 90/90, high density BB exterior (Douglas Fir) B Grade.
  - 2. Plugged-core (Douglas Fir) with  $\frac{1}{2}$  inch maximum gaps.
  - 3. Use acrylic laminate that is compatible with the reflective sheeting adhesive, and that does not require the removal of the release agents before applying the sheeting.
- D. Posts:
  - 1. Timber Sign Post (P1)
    - a. Refer to Section 06055

2. Tubular Steel Sign Post (P2)
    - a. Post: ASTM A 513
    - b. Finish: Galvanize ASTM A 653
    - c. Shape: As shown, wall thickness 0.080
    - d. Color: Powder coated as required
  3. Square Steel Sign Post (P3)
    - a. Post: ASTM A 1011 Grade 50
    - b. Finish: Galvanize ASTM A 653
    - c. Shape: 12 gauge or 10 gauge steel
    - d. Color: Powder coated as required
  4. Slip Base Tubular Steel Sign Post (P4)
    - a. Post ASTM A 500 Grade C; 46,000 psi minimum yield
    - b. Finish: Galvanize ASTM A 153
    - c. Shape: As shown; schedule 80
    - d. Color: Powder coated as required
  5. Steel Sign Post (P5)
    - a. Refer to Section 05120
- E. Reflective Sheeting:
1. Meet Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03.
  2. Conform to 23CFR655 Subpart F for Standard Highway colors for Ordinary and Fluorescent Sheeting.
  3. Meet or exceed the minimum requirements of ASTM Type IX.
- F. Nonreflective Sheeting: As specified and in accordance with the recommendation of the reflective sheeting manufacturer.
- G. Fasteners: As specified. Meet ASTM A 314, Class 304, 18-8, Stainless Steel.
- H. Foundation
1. Concrete: Class A (AE). Refer to Section 03055.
  2. Reinforcing steel: Refer to Section 03211.
  3. Anchor bolts: Refer to Section 05120.
- I. Structural Steel: Structural Steel frame. Refer to Section 05120.
- J. Temporary covering: Opaque material.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Coordinate utility location.

- B. Excavate: Refer to Section 02317.
- C. Install traffic control devices before work activities begin.

### **3.2 INSTALLATION - GENERAL**

- A. Do not reverse screen sign larger than 7 ft<sup>2</sup>/color.
- B. Do not remove a sign that is being replaced until the new sign is placed and uncovered.
- C. Compact backfill to a density equal to surrounding materials.
- D. Establish proper elevation and orientation of all signs and structures, and determine proper sign post lengths as dictated by construction slopes.
- E. Cover signs that require temporary covering with an opaque material. Secure at the rear of the sign so that the sign is not damaged. Maintain covering until covering or sign is removed.
- F. Construct sign post foundations with concrete conforming to indicated dimensions.

### **3.3 RELOCATING EXISTING SIGN**

- A. Retrofit as required to meet current standards.
- B. Provide new posts and accessories as required.
- C. Remove foundations to a minimum of 6 inches below the ground line, and backfill.

### **3.4 REMOVING EXISTING SIGN**

- A. Remove foundations to a minimum of 6 inches below the ground line and backfill.

END OF SECTION

**Supplemental Specification  
2005 Standard Specification Book**

**SECTION 02982**

**BRIDGE CONCRETE GRINDING**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Procedure for grinding new concrete bridge decks and approach slabs for precast concrete deck panel system or as shown on the plans.

**1.2      RELATED SECTIONS**

- A.      Section 01452: Profilograph and Pavement Smoothness

**PART 2      PRODUCTS**

**2.1      EQUIPMENT**

- A.      Provide and operate equipment utilizing diamond blades mounted on a self-propelled machine designed for grinding and texturing pavement.
- B.      Do not use equipment that causes damage to the transverse or longitudinal joints.
- C.      Use vacuuming equipment to remove residue and excess water.

**PART 3      EXECUTION**

**3.1      GRINDING**

- A.      Grind concrete bridge deck until the surface of both sides of closure-pour and deck-panel joint are in the same plane and meet the smoothness required.
  - 1.      Cure shear stud blockout locations for 24 hours before grinding.
  - 2.      Meet the straight-edge requirements after grinding for all locations.
  - 3.      Maximum depth of milling is ¼ inch.



- B. Provide a uniform finished texture.
- C. Perform grinding in a longitudinal direction.
  - 1. Begin and end grinding at lines normal to the bridge centerline.
- D. Do not damage the deck.
- E. Create a surface in a parallel, corduroy-type texture consisting of grooves between  $\frac{1}{16}$  and  $\frac{1}{8}$  inches wide.
  - 1. The peaks of the ridges need to be approximately  $\frac{1}{16}$  inch higher than the bottom of the grooves.
- F. Maintain cross slope drainage.
- G. Provide uniform transverse and longitudinal slope of the concrete deck with no depressions or misalignment of slope greater than  $\frac{1}{8}$  inch in 10 ft when tested with a 10-ft straightedge.
- H. All tailings from the grinding process become property and responsibility of the Contractor.

### **3.2 SMOOTHNESS TESTS**

- A. Follow Section 01452.

END OF SECTION

**Supplemental Specification  
2005 Standard Specification Book**

**SECTION 03575**

**FLOWABLE FILL**

**Delete Section 03575 and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Materials and procedures for placing flowable fill.

**1.2      RELATED SECTIONS**

- A.      Section 03055: Portland Cement Concrete

**1.3      REFERENCES**

- A.      AASHTO M 154: Air-Entraining Admixtures for Concrete
- B.      AASHTO M 194: Chemical Admixture for Concrete
- C.      ASTM D 4832: Preparation and Testing of Controlled Low Strength Material (CLSM) Test

**1.4      SUBMITTALS**

- A.      Batch Proportions: Submit to Engineer seven days before placement.
- B.      Trial Batch:
  - 1.      Submit certified test results or conduct laboratory trial batch to verify strength prior to placement.

## **PART 2      PRODUCTS**

### **2.1      MATERIALS**

- A.      Cement: Refer to Section 03055 Portland Cement Concrete.
- B.      Pozzolan: Refer to Section 03055 Portland Cement Concrete .
- C.      Sand.
- D.      Coarse aggregate: Determine a suitable aggregate size and gradation for the intended application.
- E.      Admixtures:
  - 1.      Water reducers and set accelerators: AASHTO M 194.
  - 2.      Air entrainment: AASHTO M 154.

## **PART 3      EXECUTION**

### **3.1      INSTALLATION**

- A.      Combine materials to meet the requirements for strength and constructability as required. Determine strength from trial batches at 28 days.
  - 1.      Minimum strength: 50 psi. ASTM D 4832.
  - 2.      Maximum strength: 150 psi. ASTM D 4832.
  - 3.      Slump: 5 inches to 10 inches.
- B.      Determine a suitable aggregate size and gradation for the intended application.

END OF SECTION